- Mead's new bleach plant
- Dispersed, dissolved, and pressure-sensitive adhesives
- Matching drive and load characteristics
- APPA and TAPPI meetings

The Paper Industry

Publishers of PAPER AND PULP MILL CATALOGUE

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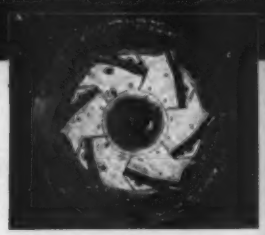
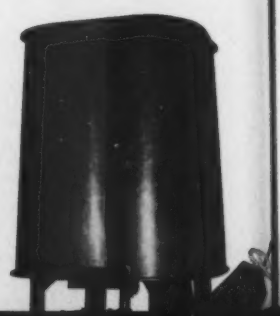
For further information, please write to The Emerson Manufacturing Co., Division of John W. Bolton & Sons, Inc., Lawrence, Massachusetts.



The rotor and extraction plate

View of vortex and stock flow at 8-9% consistency



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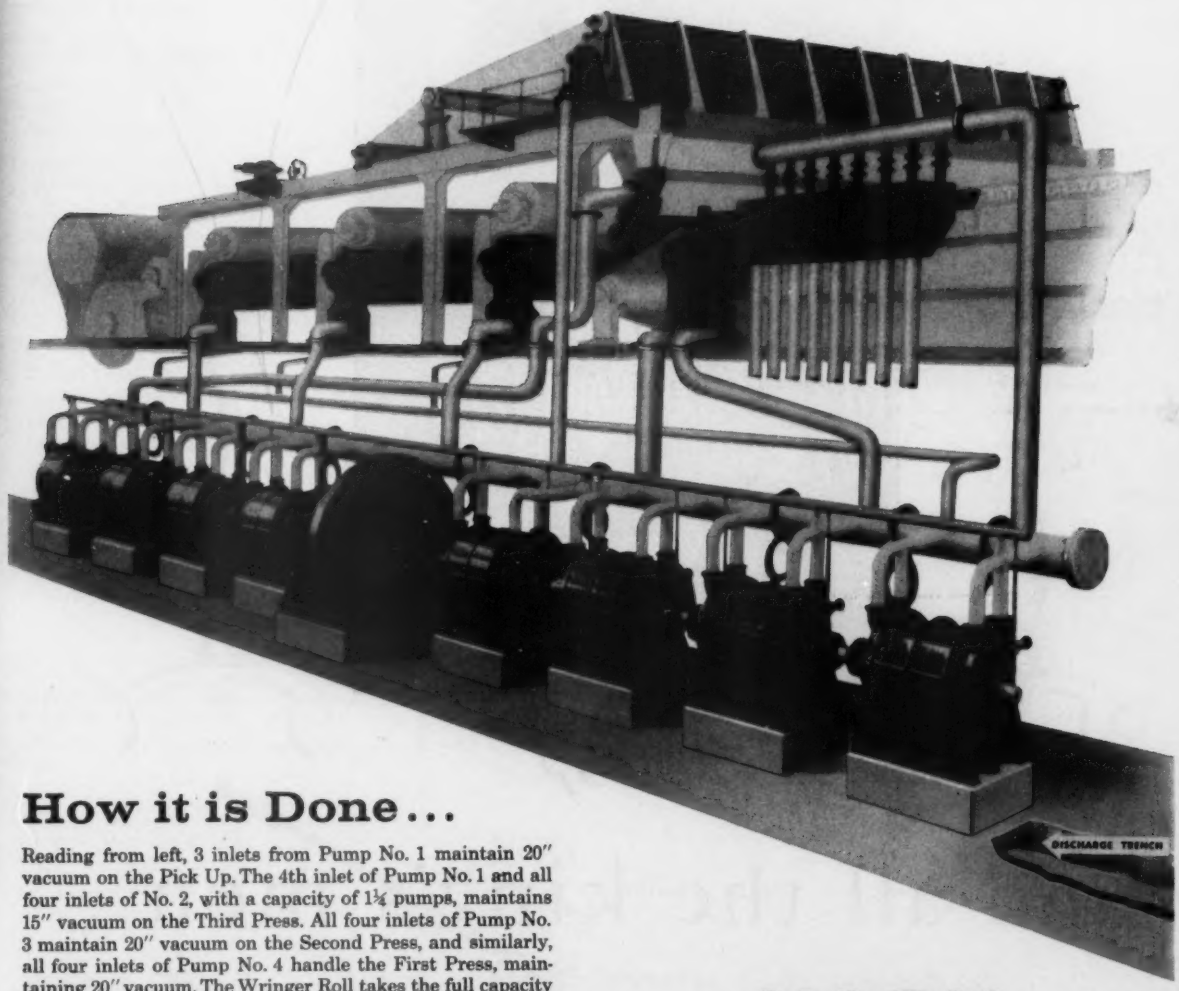

How it is Done...

Reading from left, 3 inlets from Pump No. 1 maintain 20" vacuum on the Pick Up. The 4th inlet of Pump No. 1 and all four inlets of No. 2, with a capacity of 1¼ pumps, maintains 15" vacuum on the Third Press. All four inlets of Pump No. 3 maintain 20" vacuum on the Second Press, and similarly, all four inlets of Pump No. 4 handle the First Press, maintaining 20" vacuum. The Wringer Roll takes the full capacity of Pump No. 5, requiring 10" vacuum. The High Vacuum Couch Box takes a pump and a half, 4 inlets of Pump No. 6, and two inlets of Pump No. 7, maintaining 20" vacuum. The remaining two inlets of Pump No. 7 maintain 10" vacuum on the Low Vacuum Couch Box. Only one inlet of Pump No. 8 is required to handle the Felt Conditioners at 10" and the remaining three inlets of Pump No. 8 handily maintain 10" vacuum on the Wire Boxes.

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The Paper Industry

Technology • Engineering • Management • Production

VOLUME 41 **NUMBER 12** **MARCH 1960**

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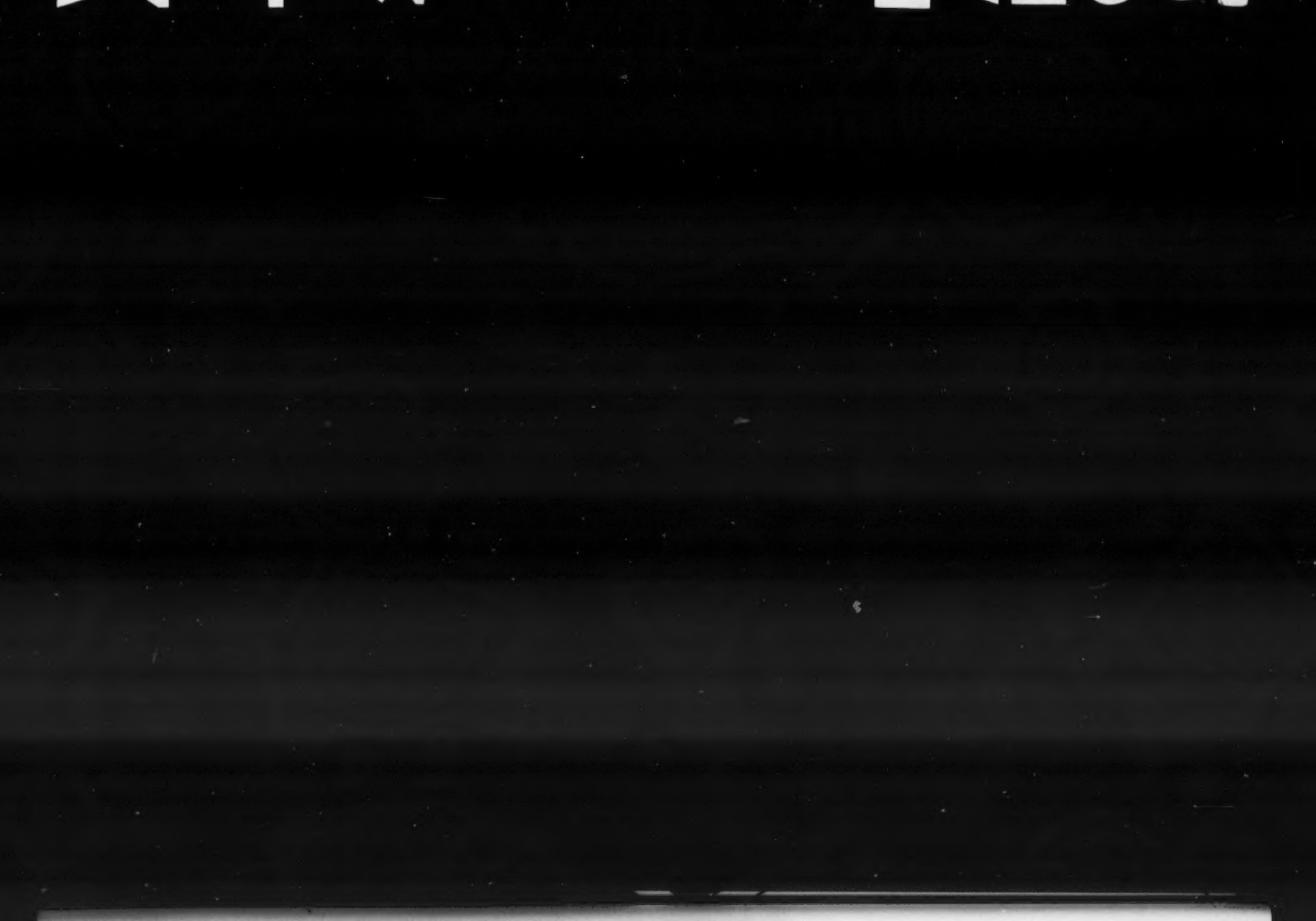

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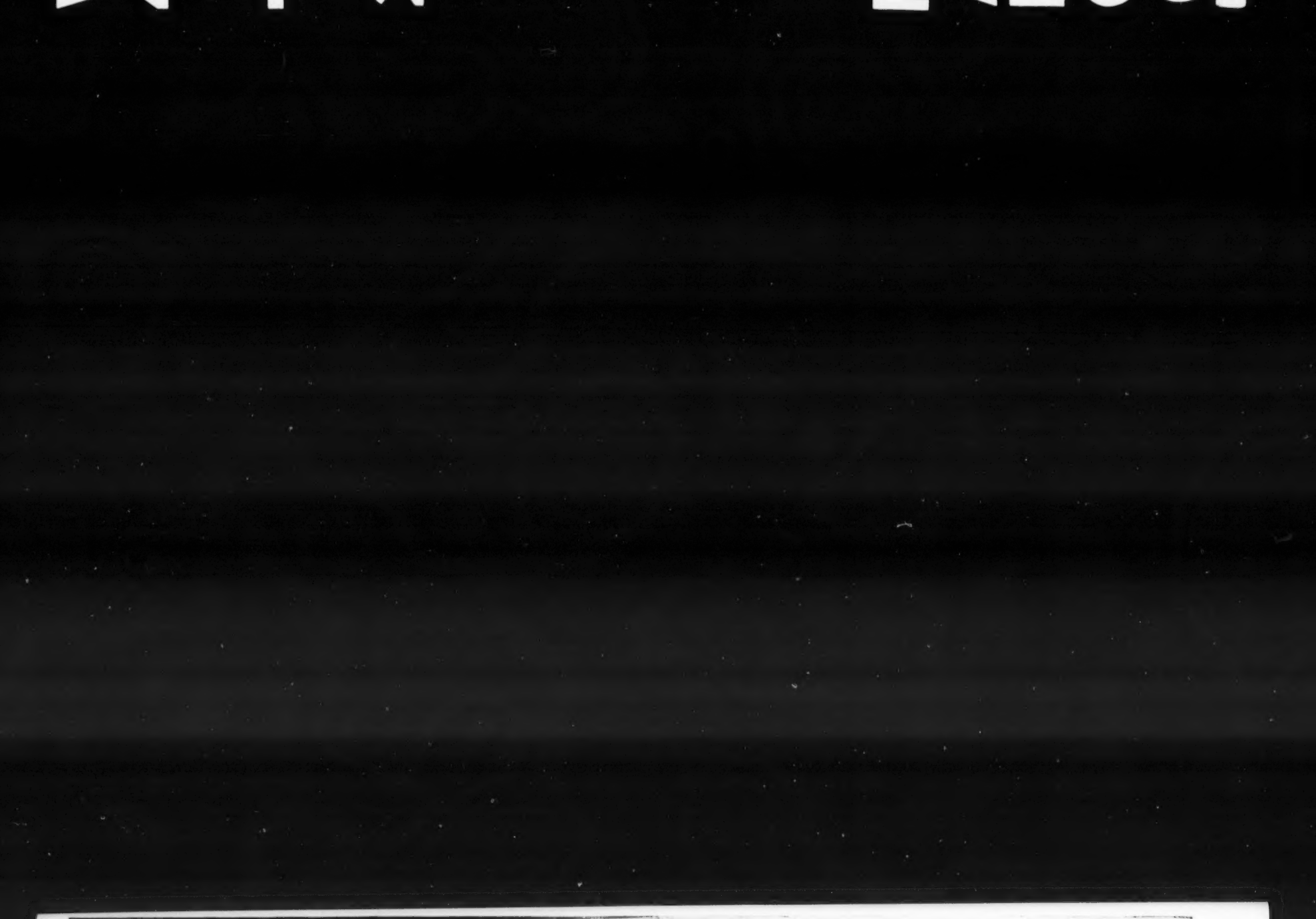


From our point of view . .

Conscious efforts or decisions by default?

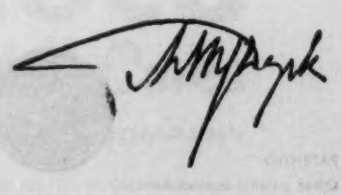
It is to be hoped that Richard E. McArdle's talk at the Open Industry Meeting of the American Paper and Pulp Association will start a serious trend of thought — not only in the direction of assuring for this industry adequate future pulpwood supplies, for which it was intended — but also in our thinking, planning and in our general approach to progress.

Mr. McArdle expressed concern over the availability of adequate supplies of pulpwood for future needs. A continuous and adequate supply of pulpwood cannot be assured, he said, "unless we stage a tremendous push". To assure a reasonably adequate supply of pulpwood would mean "conscious effort, not decision by default".

We can go even further in the application of this principle. We, as a nation, have the potential capacity that would assure this country an unlimited period of growth and prosperity if we put more conscious effort into our planning and eliminated from it the "decision-by-default" attitude.

Unfortunately much of our progress suffers because it is not premised strongly enough on conscious effort. Thus, we often delay necessary machine replacements on the production line until forced into it by complete breakdown of the equipment. We waited until somebody else put a satellite into orbit before we gave this problem the serious consideration it deserves. We waited until the U.S.S.R. trained a significantly larger number of scientists and engineers before we took steps of reviewing our own educational system and facilities. Our legislators often delay obvious and important legislation until the people are aroused and demand positive action.

These are only a few examples that might fall into the category of "decisions by default". How much more secure would we feel as an industry and as a nation if, by putting more conscious effort into our actions and planning, we were to move into a position where we could better anticipate problems and acquire the courage and facilities to tackle them promptly and decisively as they make their appearance. Only by conscious effort and not through decisions by default can we retain our vigorous leadership, both as an industry and as a nation.



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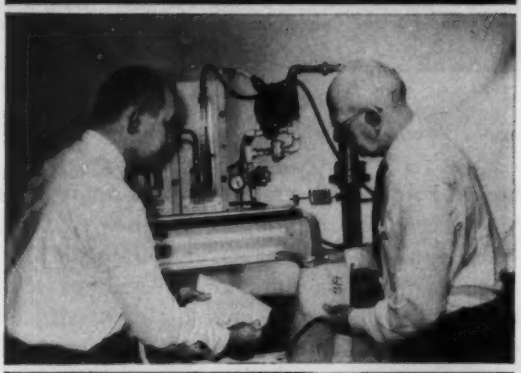
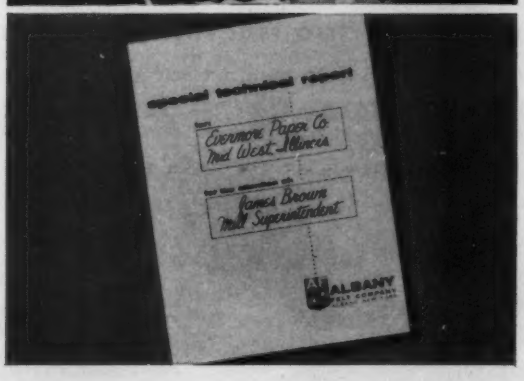


2. Laboratory testing

Next we use the latest scientific equipment and chemicals to test portions of your used felts to discover the best cleaning compounds and washing equipment to fit your needs.



3. Written report

Specially trained engineers then submit a written report to you covering every phase of their recommendations of a felt washing program tailored to your operation.

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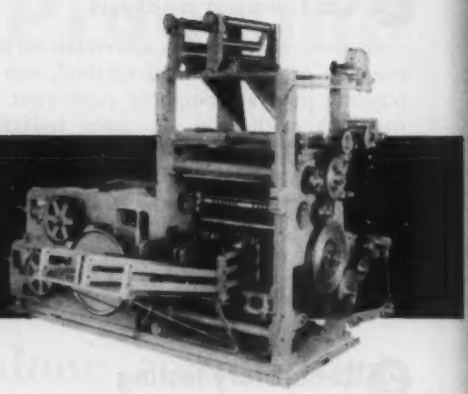

New Napkin Folder with embosser runs open-center napkins! Newest Napkin Folder from PCMCo. is the Model 2066 for running edge-embossed facial type napkins. Vacuum folding produces quarter fold or the popular double transverse eightfold. A name embosser and constant tension, belt-driven unwind are standard on the 2066. In the next converting machinery you buy, get the profitable benefits of *creative* engineering. Contact Paper Converting in the development stage to be sure you have the very latest in converting ideas.

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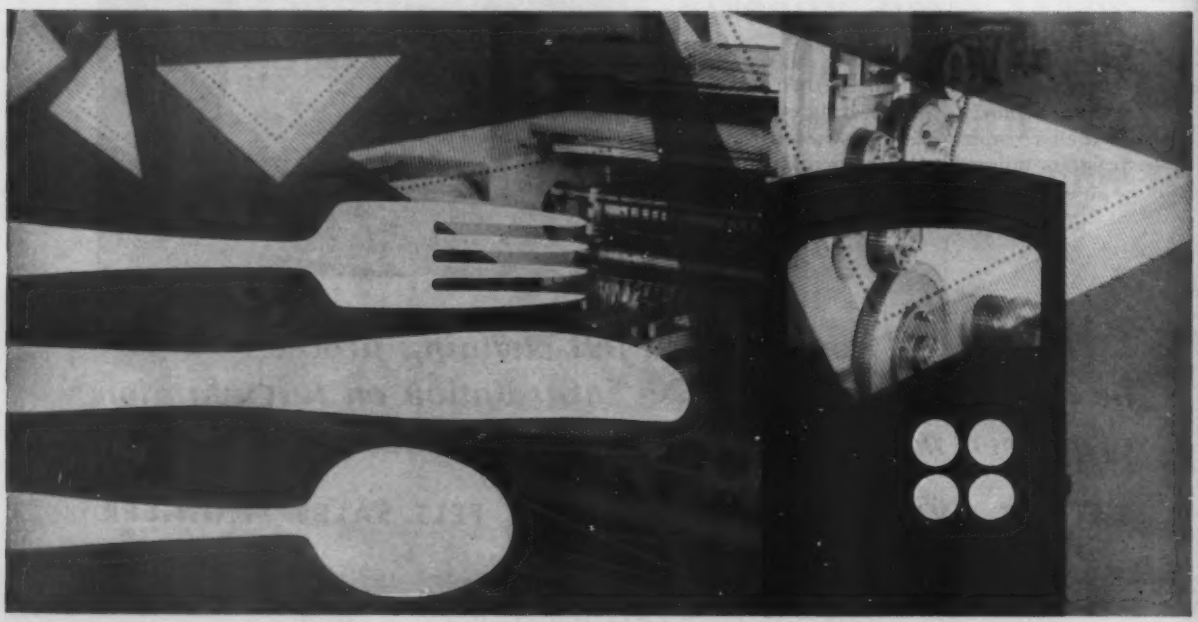

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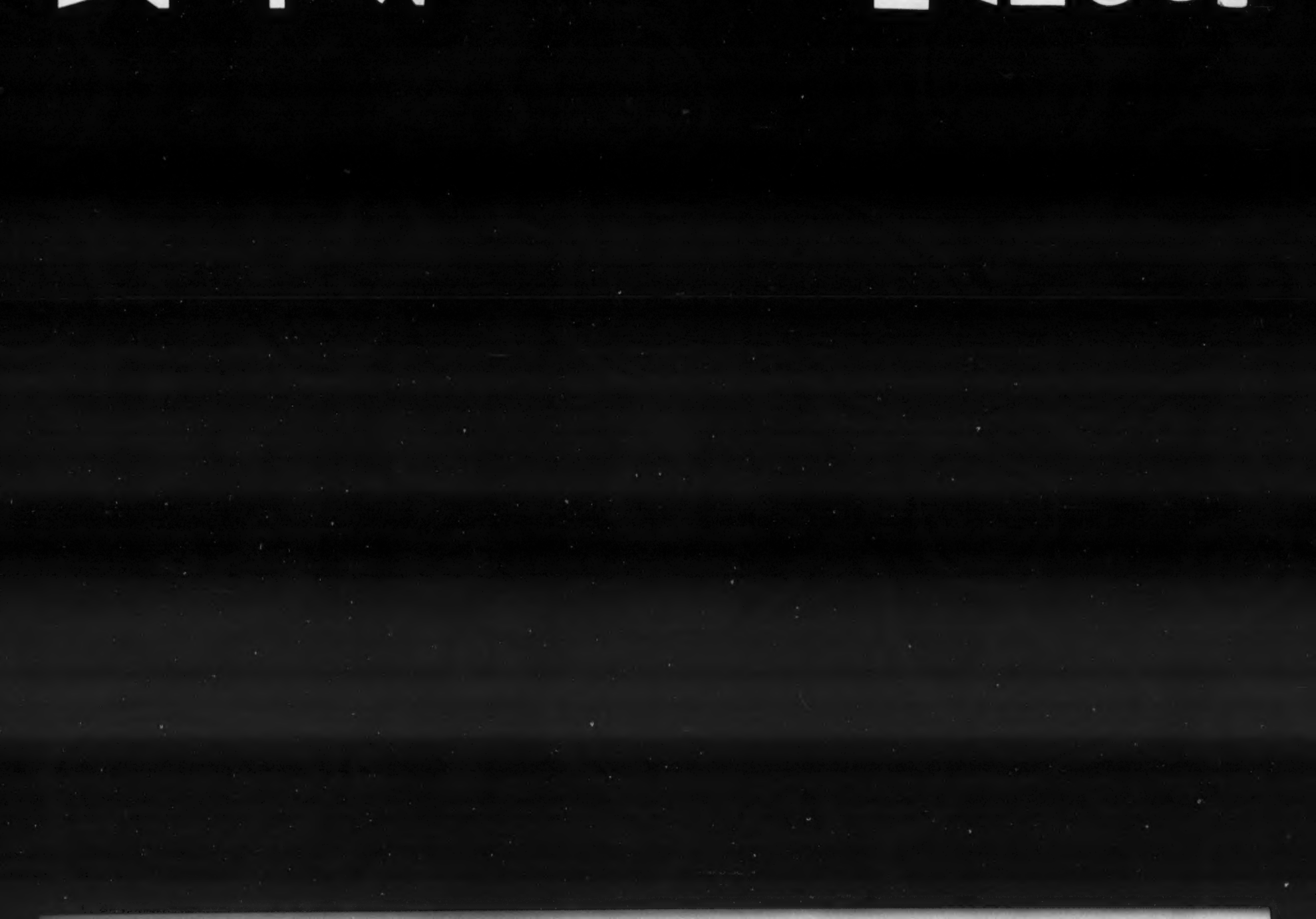

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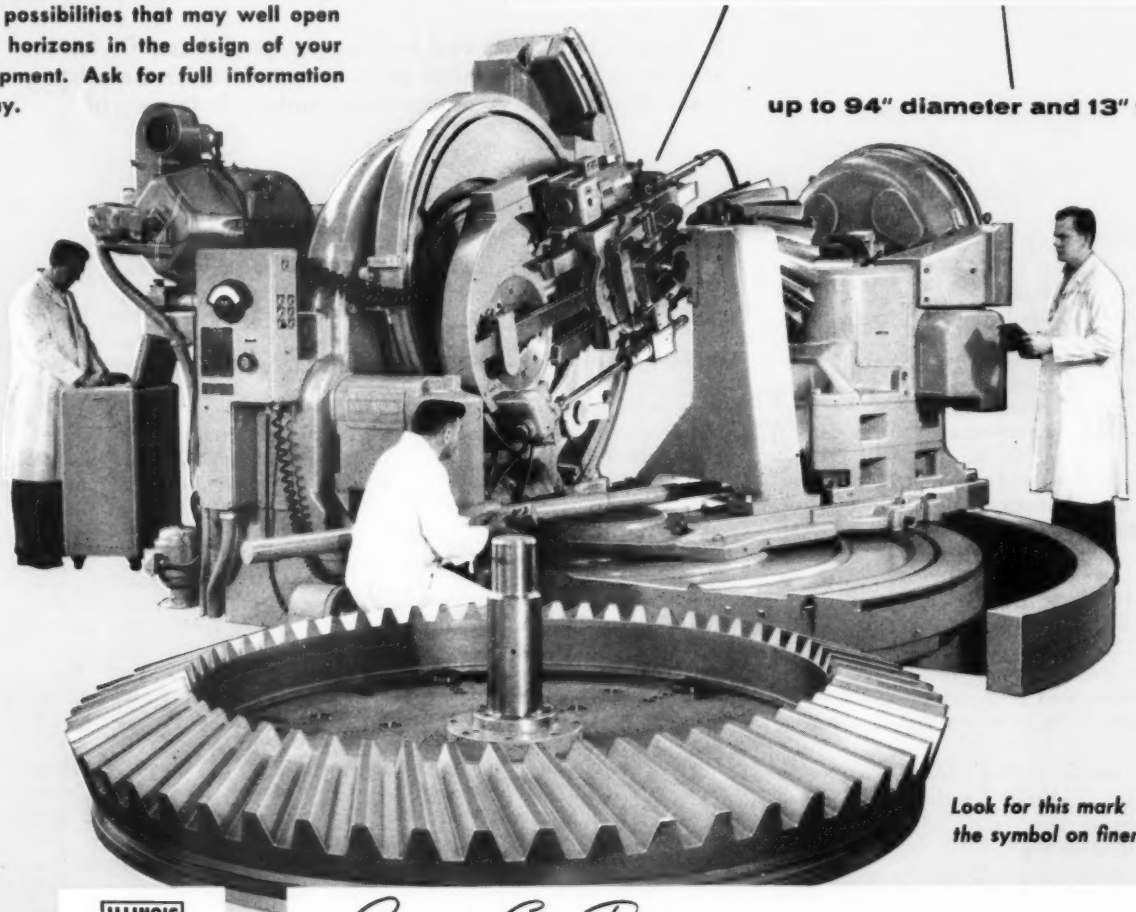

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Mead's new bleach plant in operation

A. W. J. DYCK

Impco's bleaching and washing equipment and Taylor Instrument's graphic control panel are combined in a design to make this plant one of the most modern in the world.

THE MEAD CORPORATION'S 500 ton per day capacity bleach plant went into operation in September, 1959. This bleach plant — featuring largely Impco equipment — is without doubt one of the most modern in the world, both from the point of view of design and the equipment installed.

The "nerve center" of the bleach plant is the single, 24-ft.-long graphic control panel from which all bleaching operations and chlorine dioxide generation are controlled.

The plant was completely designed by Mead engineers under the direction of P. E. Fuller, chief project engineer. Collaborating on the design were Dr. G. H. Sheets, managing director of research and B. P. Bunch, production assistant in pulp and chemicals. Division Manager of the Chillicothe mill is H. H. Wheeland.

Mead's research laboratory worked out all details for the bleaching sequence, temperatures of bleaching and retention times.

The new bleach plant was installed to meet Mead's requirement for high quality pulp and the company's expanded paper-making facilities.

The bleach plant is under the supervision of L. E. Zuber, pulp mill superintendent. Operations in the plant are so well instrumented that two men per shift are now operating the entire bleach plant including the chlorine dioxide generator.

Chlorine dioxide generation

Chlorine dioxide is produced by the Solvay process, in which methyl alcohol, sodium chlorate and sulfuric acid are the raw materials that enter into the chemical reactions to produce this bleaching agent.

The chlorine dioxide generator plant is a four-ton-per-day unit and features two lead-lined reactors, two absorption towers, a 69 gph sulfuric acid pump, a Pulsafeeder pump assembly, a refrigeration system and two Glasteel storage tanks.

Methyl alcohol and sodium chlorate are metered into the reactors by a CPQ quintuplex Pulsafeeder, an assembly of five pumps driven by a single variable speed electric motor.

Sulfuric acid is pumped into the reactor by a controlled volume diaphragm pump which can meter up to 69 gal. per hour of 66° Baumè acid against a pressure of 150 psi.

The pump is equipped with a Teflon diaphragm and its process side is made of Carpenter 20 stainless steel with Hasteloy D ball checks. It is also equipped with a standard screw mechanism that permits stroke length adjustment from 0 to 100 per cent.

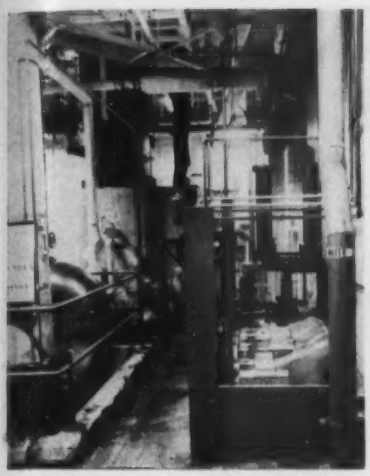
The generated chlorine dioxide gas is absorbed in two 35-ft. high absorption towers (one 15 in. and the other 24 in. in diameter) constructed of special chemical stoneware. Each tower consists of three sections packed with ½-in. chemical porcelain intalox saddles. Support plates are of the gas injection type in which risers above the level of the plate inject the gas into the bed.

An 81-ton capacity, No. 216-BV Chill-Vactor refrigeration unit supplies 130 gpm of 40° F water to the absorption towers. This unit consists of a two-compartment, 42-in. dia. steel plate chill tank, two 16-in. boosters, a 36-in. dia. barometric condenser and a size No. 210-J Evactor air pump.

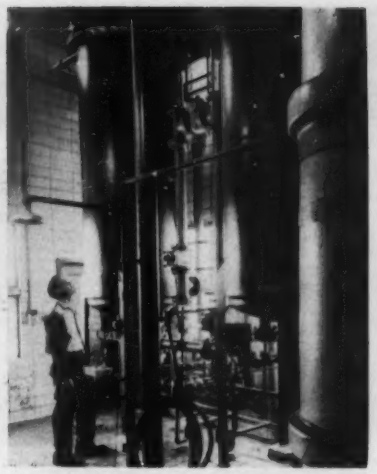
Hot water from the refrigeration system is pumped to the washers in the bleach plant to save on steam consumption.

The chlorine dioxide solution from the absorption towers, containing 6 to 8 g. of ClO_2 per litter, is stored in three Glasteel storage tanks of 15,000 gal. capacity each.

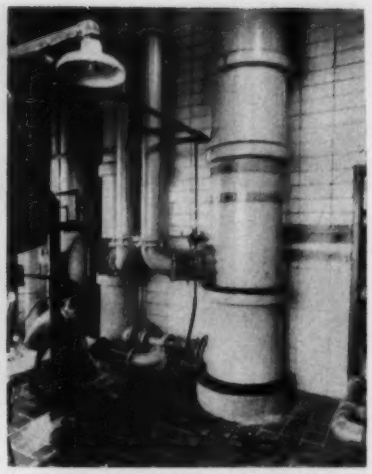
ClO_2 solution is pumped from the storage tanks to the bleach plant by a centrifugal glass metal pump.



Pulsafeeder pumps in right foreground meter chlorate and methyl alcohol.

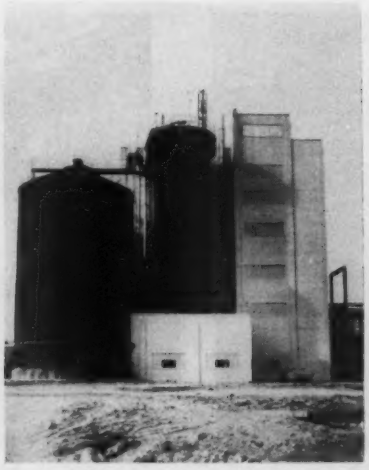


Knapp Mills Inc. lead-lined chlorine dioxide reactors.

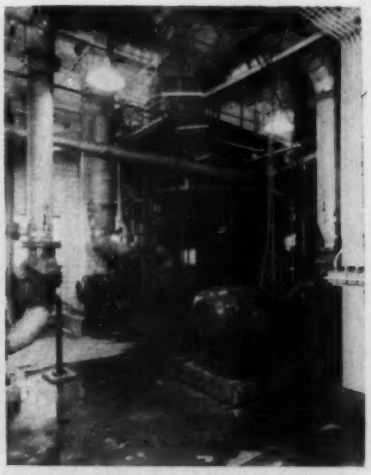


U. S. Stoneware 15-in. and 24-in. dia. chlorine dioxide absorption towers.

Impco bleach towers in background and two Pfaudler Glasteel storage tanks in foreground.

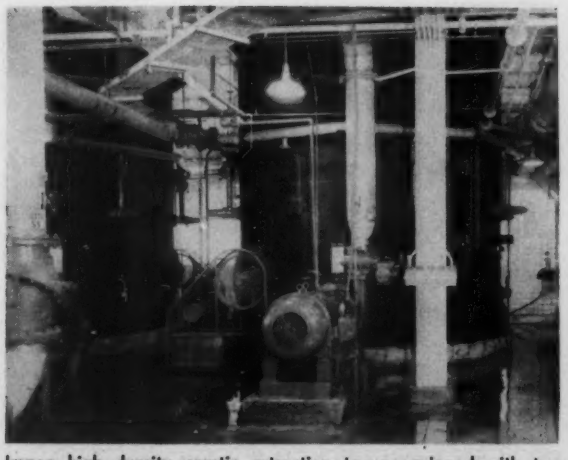


View of Kamyr chlorine dioxide bleach tower (center) equipped with scraper and circulators.



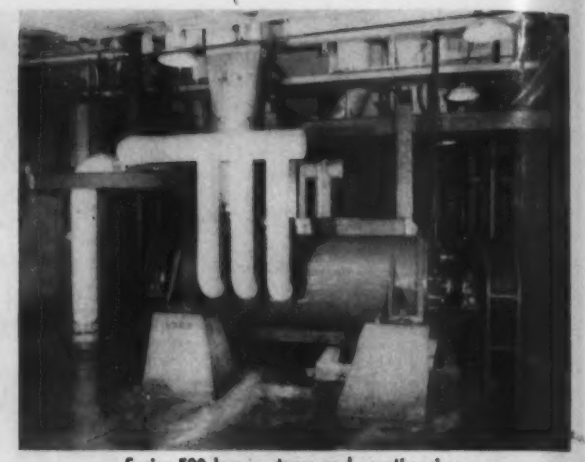
Warren stock pumps and Impco 18 ft. dia., 80 ft high hypo bleach tower.

Base of Impco chlorination tower with two Series 122 circulators and ORP chlorine control.

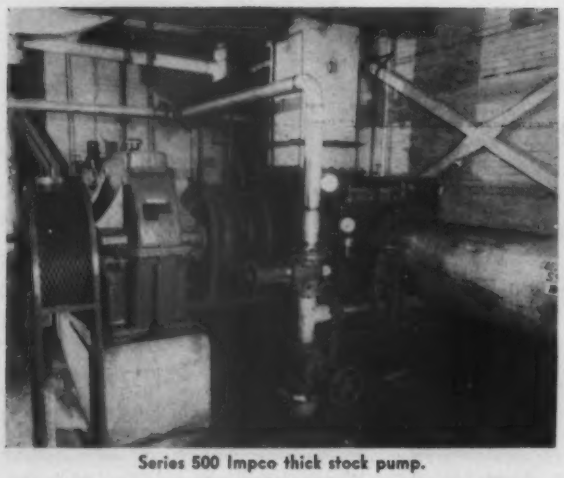


Impco high density caustic extraction tower equipped with two circulators and dilution nozzles.

Series 500 Impco chlorine mixer.



Series 500 Impco steam and caustic mixer.



Series 500 Impco thick stock pump.

Series 500 Impco ClO_2 steam mixer.

One of four Impco's 11½ by 16 ft washers equipped with pulp shredder and feeder.

Taylor Instrument Co. graphic control panel controls bleaching and ClO_2 generation.

Principal equipment installed at Mead Corporation's bleach plant

Chlorine dioxide generating plant

Chill-Vactor refrigeration system, No. 216-BV, 130 gpm of 40° F water capacity ..... Croll-Reynolds Co. Inc.
Chlorine dioxide absorption towers (2), 35 ft. high, one 15-in. and one 24-in. dia. ..... U. S. Stoneware
Chlorine dioxide reactors (2), lead-lined ..... Knapp Mills Inc.
Controlled volume diaphragm pump, 69 gph capacity, Teflon diaphragm, and Hasteloy D ball checks, for sulfuric acid metering ..... Milton Roy Co.
Glass-lined pipe, valves and fittings, 6-in. dia. ..... Pfaudler Co.
Glass-metal pumps (2), centrifugal, for handling ClO_2 liquor and hypochloride ..... Goulds-Pfaudler Co.
Glasteel storage tanks (2), 15,000-gal.-capacity each ..... Pfaudler Co.
Pulsafeeder pump assembly, CPQ quintuplex type, driven by single, variable speed motor ..... Lapp Insulator Co. Inc.
Pumps (3), handling methyl alcohol and sodium chlorate ..... Goulds Pumps Inc.

Bleach plant

Air compressors, provide compressed air for instruments and H_2SO_4 unloading ..... Ingersoll-Rand Co.
Caustic extraction tower, down-flow type, 14-ft. by 50-ft., tile-lined, with two circulators ..... Improved Machinery Inc.
Chlorine bleach tower, up-flow type, 17-ft. by 68-ft., equipped with four circulators ..... Improved Machinery Inc.
Chlorine dioxide bleach tower, Kamyr up-flow type, 18-ft. by 74-ft., steel-membrane and tile-lined, equipped with scraper and circulators ..... Sandy Hill Iron & Brass Works
Chlorine mixer, wabble-type ..... Improved Machinery Inc.
Chlorine vaporizer, 2,000 lb/hr. capacity, featuring multi-pass, steam-jacketed vaporizing chamber ..... Whitlock Mfg. Co.
Consistency regulators, pipe-line type ..... DeZurik Corp.
Graphic control panel, controls all bleaching and ClO_2 generation, 24-ft. long, including 31 recorder controllers, 25 indicating stations, 20 manual control stations, 40 push button stations, 30 graphic running lights, 12 visible and audible alarms, 4 integrators, and 4 master rheostat washer speed controls ..... Taylor Instrument Co.
Hypochlorite bleach tower, down-flow type, 18-ft. by 80-ft., tile-lined, with two circulators ..... Improved Machinery Inc.
Magnetic flow meters ..... Foxboro Co.
Mixers (3), Series 500 ..... Improved Machinery Inc.
Pumps (6), centrifugal, one 2,000 gpm, one 2,700 gpm, two 2,750 gpm, one 4,300 gpm, and one 5,000 gpm, single end-suction, open impeller; for pumping stock and filtrate to the washers ..... Warren Pumps Inc.
Pumps (5), filtrate to ClO_2 washer, and for handling caustic, chlorine dioxide and water ..... Goulds Pumps Inc.
Thick stock pumps (4), Series 500 ..... Improved Machinery Inc.
Washers (4), 11½ by 16-ft., equipped with pulp shredder and feeder; two are rubber-covered, one of steel construction, and one of stainless steel ..... Improved Machinery Inc.

General

Air dryers ..... Pittsburgh Lectrodryer Co.
Bonnetless knife gate valves ..... DeZurik Corp.
Crane ..... Conco Engineering Works
Elevator, 2,500 lb. capacity, 100 fpm, operated by single automatic push button ..... Otis Elevator Co.
Fittings, steel, iron, copper, PVC, and rubber-lined ..... Grinnell Co.
Heating and ventilating equipment ..... J. O. Ross Engineering Co.
Motors, electric ..... Reliance Electric & Engineering Co. Westinghouse Electric Corp., Allis-Chalmers Mfg. Co.
Motor controls ..... Clark Controller Co.
Pipe, carbon steel, wrought iron, PVC, stainless steel ..... Grinnell Co.
Pipe, Saran-lined ..... Saran Lined Pipe Co.
Power substations ..... General Electric Co.
Pumps (5), for water and caustic ..... Goulds Pumps Inc.
PVC fans and ducts ..... Atlas Mineral Products Co.
Rubber lining for chlorination tower ..... U. S. Rubber Co.
Stainless steel pipe ..... Bristol Metal Products Co., Felker Bros., Grinnell Co.
Structural steel ..... Oregonia Bridge Co.
Tanks and steel bleaching towers ..... Chattanooga Boiler & Tank Co.
Tile vats and chests, tile linings ..... Service & Erection Co.
Valves, Saunders diaphragm, Weir-type, motor and hand-wheel-operated ..... Grinnell Co.
Valves, steel, brass, check and plug ..... Grinnell Co.
Vee port stock control valves ..... DeZurik Corp.

Bleach plant

Pulp at 4 per cent consistency is pumped from the low density storage tank equipped with level controller to a surge chest and then by a 2,750 gpm pump through a pipe-line consistency regulator (which adjusts its consistency to 3.5 per cent) and the magnetic flow meter into a 17-ft. dia by 68-ft. high, rubber-lined steel, up-flow, chlorine bleach tower.

Provisions are made for removal of pulp samples for O.R.P. analysis ahead of the chlorine tower to determine the chlorine requirements of the pulp.

Liquid chlorine is vaporized in a 2,000 lb.-per-hour capacity vaporizer equipped with a multi-pass, steam-jacketed vaporizing chamber which delivers dry chlorine gas to the system. The chlorine chamber is designed for a pressure of 150 psi, while the steam chamber is designed for a pressure of 30 psi.

Chlorine from the vaporizer, together with the stock, enters the chlorine tower through a wabble-type mixer. The chlorine tower is equipped with four circulators. Retention time in the chlorine tower is 45 min. at 75° F.

From the chlorine tower, pulp flows by gravity into a rubber-covered 11½- by 16-ft. washer equipped with pulp shredder and feeder. It is then pumped by a Series 500 thick stock pump through a Series 500 mixer into the 14-ft. dia. by 50-ft. high, tile-lined steel, down-flow caustic extraction tower equipped with two circulators. Retention time in the caustic extraction tower is 60 min. at 140° F.

From the caustic extraction tower, stock is pumped by a 2,750 gpm pump to another 11½- by 16-ft. washer of steel construction. It is then pumped by a thick stock pump to a Series 500 mixer located on top of the 18-ft. dia. by 80-ft. high, down-flow hypo-tower. The mixer is located on top of the tower to prevent scale formation in the pipe line subsequent to the introduction of hypochlorite.

The hypo-tower is of tile-lined steel construction and equipped with two circulators. Rentention time in the hypo-tower is 180 minutes at 95° F.

Following the hypo-tower, stock is pumped by a 2,700 gpm pump through a pipe line consistency regulator and a magnetic flow meter to the hypo-washer. The stock output from the hypo-tower is accurately measured to determine the exact quantity of ClO_2 required for completion of the bleaching operation in case of varying stock output.

The hypo-stock is then washed in a rubber-covered, 11½- by 16-ft. washer and pumped through a Series 500 mixer into an 18-ft. dia. by 74-ft high, steel-membrane and tile-lined up-flow chlorine dioxide tower. Retention time in the ClO_2 tower is 200 min. at 160° F.

ClO_2-bleached pulp is scraped off the top of the tower by a scraper and treated with sodium hydroxide to in-

(Continued on page 855)

Adhesives in the paper industry

Part VII (Continued): Important adhesive forms—water-dispersed adhesives, lacquer- and solvent-activated adhesives, and pressure-sensitive adhesives

ONE of the most popular forms for the synthetic resin adhesives are the water-dispersed forms. These are known respectively as emulsions and latices. Although there is no clear distinction between these two terms, the term "latex" is usually reserved for an elastomeric material such as natural or synthetic rubber, whereas the term "emulsion" is reserved for resins of the polyvinyl acetate or acrylic type.

Most emulsions used by the adhesives industry are of the vinyl type and these frequently have an acid pH. They give continuous films on drying which are quite strong and water resistant. These may be stiff for which reason plasticizers are frequently required. When properly formulated, they provide adhesion to foil, plastic films, cellulosic materials, wood and metal. Their outstanding characteristics are their high adhesive strength, their fast setting characteristics, their good color and their resistance to humidity, grease and molds. Normally, the machines applying them are easily cleaned although, if the formulations are very water-resistant, solvent may be necessary for the clean-up operation.

Such adhesives are used for case and carton sealing, tube winding, paper cups, milk containers, envelopes, folding boxes, trays, greaseproof coatings, heat-seal coatings, cellophane and acetate windows, cellophane bags, padding, paper bag seams, bag sealing and bar wrapping.

The water dispersed adhesives based on natural or synthetic rubber or on reclaimed rubber usually have an alkaline pH. Films from these are flexible and may be permanently tacky if desired. The synthetic latices provide films with better strength and adhesion than is obtainable with natural rubber. These adhesives adhere to surfaces such as varnished papers, foil, plastics, wood and metal. The dried films are usually quite water-resistant for which reason solvent is required for clean-up. Such adhesives are used for foil to paper lamination, for the manufacture of bags from plastic materials, for labels which are to be applied to inked or varnished surfaces, for case liner sealing, for labeling water-resistant drums, for pressure-sensitive coatings and for adhesives for waxed surfaces.

Lacquer and solvent activated adhesives

The term lacquer is applied to an adhesive which is primarily a solution in an organic solvent rather than in water. Lacquers may be based on a wide variety of synthetic resins including virtually any of the thermoplastic resins already discussed. Solutions of nitrocellulose, synthetic rubber, polyvinyl acetate, and acrylics are all termed lacquers. The setting and drying speeds of lacquers can be controlled by the rate of evaporation of the solvents used. The films vary from hard, non-tacky layers to soft, pressure-sensitive films. Most of these products are flammable and solvents must be used for clean-up.

Lacquers are used for cellophane bags, window cartons, waterproof labeling and overcoating, heat-seal coatings especially for skin and blister packaging, for gloss and greaseproof coatings, for plastic film laminations and for rubber to metal and metal to metal bonds.

Solvent-activated adhesives as their name indicates are those which become tacky in the presence of small quantities of solvent. Virtually all of the lacquer types of adhesives fall into this category. A specialized form of such adhesives is found in cigarette packaging where the nitrocellulose film on the cellophane wrapper is activated by solvent in order to make the bond required in the package.

In addition to nitrocellulose, a variety of other resins can be activated by solvent including the acrylates, rubber, vinyls, alkyd resins, the cellulose derivatives, and a variety of natural resins, such as shellac, rosin, natural rubber, gum, starches and proteins.

The solvent used is generally one which is a good solvent for the adhesive mixture. As with most adhesive compositions, the solvent-activated adhesives contain, in addition to their basic resins, plasticizers and tackifiers.

The natural products such as vegetable gums, starches and protein glues may all be formulated with a solvent — in this case, water — to obtain glues which do not gel at ordinary temperatures and which have sufficient tack, due to the water present, to effect a bond. Once the water escapes, the bond has a degree of permanency. The rubber-based adhesives may be formulated similarly, except the solvents here are organic. Usually, these are aliphatic hydrocarbons, although polar solvents such as alcohol may be necessary in order to obtain workable viscosities. These adhesives are useful in many applications, including adhesives for labels, envelopes, papers of all sorts, bookbinding, gummed tape manufacture and food packaging, as well, of course, as household glues. Rubber-based cements are particularly valuable where flexible materials such as leather are to be bonded. They are also used in the shoe and luggage trade. Cellulose nitrate also provides the basis for shoe cements and for household glues.

Pressure-sensitive adhesives

One of the most important advances of recent years in the packaging industry is the advent of pressure-sensitive adhesives. In this category may be included not only the familiar "Scotch" tape products but also a variety of masking tapes which find wide application in industry. As a matter of fact, it has been pointed out that the

painting of automobiles on an assembly line basis could not be carried out if it were not for the masking tape which keeps paint off the glass and chromium portions of the car.

Pressure-sensitive adhesives are normally defined as those which are tacky under ordinary conditions and which form a bond readily when slight pressure is applied. The patent literature is filled with numerous references to formulations for these products. They are normally used in the form of adhesive tapes, and the adhesive serves to attach the tape to another surface. If the other surface is in two parts — e.g., two sheets of paper — the pressure-sensitive tape obviously bonds these two pieces of paper together. Technology has been developed today to the point where the pressure-sensitive tape may be removed without leaving any of the adhesive on the substrate. Another important problem which has been solved is that of keeping the tape from adhering to itself when it is rolled tightly. This has been solved by coating the back of the tape with a release agent which prevents the adhesive from sticking, but which does not contaminate the adhesive.

The backing or tape to which the pressure-sensitive adhesive is applied may consist of fabric, film, or paper. For surgical tapes, cotton is normally used. In the electrical industry, plastic films such as cellulose acetate are important. Also, fiber glass may be used as a backing for tapes in the electrical industry. Silk and woven asbestos tapes have specialized applications, whereas normal masking tape employs paper. Cellophane is, of course, the most commonly used backing, and cellulose acetate runs a close second. Newer films such as Mylar can also be used when special strength characteristics or barrier properties are required. Metal foils also find specialty uses in this area.

The original pressure-sensitive adhesives were based on natural rubber. The rubber shortage created by World War II made necessary the use of synthetic materials and reclaimed rubber. Actually, the butadiene-styrene copolymers described above have been used quite successfully in the formulation of pressure-sensitive adhesives. Polyisobutylene is an elastomeric material which also has been used successfully.

Butyl rubber, Neoprene, acrylic and vinyl polymers, and even alkyd resins have all been used as bases for pressure-sensitive adhesives.

In addition to the elastomeric component, certain resins must be added in order to provide tack, specific adhesion, and wettability. Rosin is the prime candidate for this portion of the composition. Certain rosin derivatives, such as hydrogenated rosin, rosin esters, and dehydrogenated rosin, all offer certain improvements. Certain phenolic resins and coumarone-indene resins also are used.

In addition to these two important ingredients, certain plasticizers, fillers, antioxidants, and modifiers are also included. The ingredients are usually compounded on a rubber roll to obtain viscous masses, which either must be heated or put into solution so that they can be applied readily to the backing tape. The heating operation is one in which the adhesive mass is calendered onto the substrate. The solvent operation is a simple coating procedure.

Still another important aspect of the technology involved here is the use of a primer coat between the tape and the adhesive in order to promote adhesion of the pressure-sensitive layer. Thus, a typical pressure-sensitive adhesive will consist of four components: the tape itself, the primer layer, the adhesive and the coating on the back of the tape to prevent sticking in a tight roll.

There are a variety of uses for pressure-sensitive tapes. Surgical adhesive tapes are, of course, well-known. Industrial applications for these tapes have been outlined in the Encyclopedia of Chemical Technology as follows (reference 2, Vol. 1, p. 201):

1. Masking, of the type which is necessary during spray painting.
2. Stenciling, an application similar to masking but related to the application of names and numbers to cars, buses, glass windows, etc.
3. Protection, such as tapes which prevent the corrosion or abrasion of a variety of substances during manufacture or shipment. Actually, there are available today tapes which may be used to wrap items such as pipe in order to prevent corrosion during use.
4. Packaging uses, such as the closing of bags, packages, and boxes by use of tape.
5. Sealing, such as the closing of openings or cracks around doors prior to fumigation.
6. Holding, such as keeping doors of refrigerators or stoves in place during shipment.
7. Identifying, such as the marking of pipelines, wires, etc. for easy identification, using colored tapes.
8. Insulating, such as the protection of coils of electric motors.
9. Reinforcing, such as the strengthening of leather or fabrics in the manufacture of bags, belts and shoes.

The packaging industry is, of course, most interested in pressure-sensitive adhesives for the sealing of cartons and shipping cases made from paper and fiberboards. The high strength tapes which are reinforced with glass fiber or with nylon thread can be used in place of steel strapping around heavy fiberboard cases. These tapes actually have an advantage over steel since they are easier to work with and since they do not abrade or crush the fiberboard to the extent that steel straps do.

Bleach Plant

(Continued from page 853)

activate excess ClO_2. It is then washed on an 11½- by 16-ft. washer made of 317 SS stainless steel.

The high-density bleached pulp, of 86 to 88 G.E. brightness, is then pumped by a Series 500 thick stock pump into a 36- by 55-ft., tile-lined high-density storage tower. From here it is pumped by a 2,000 gpm pump through a consistency regulator to the stock refining system at 4½ per cent consistency.

Graphic control panel

Both chlorine dioxide generation and bleaching operations are controlled from a single 20-ft.-long graphic control panel which includes 31 recorder controllers, 25 indicating stations, 20 manual control stations, 40 push button stations, 30 graphic running lights, 12 visible and audible alarms, 4 integrators and 4 master rheostat washer speed controls located just below each of the washer symbols on the panel. The panel is located in an air conditioned room on the washer floor.

The sequence in which the controls are arranged on the panel (from left to right) is as follows: chlorine dioxide generation controls, brown stock storage, chlorine stage, caustic stage, hypo stage, chlorine dioxide stage, high and low density bleached stock storage. Each bleaching tower graphic symbol shows either a level recorder controller or a dual interface temperature recorder or both. All pump symbols, mixer and washer drive symbols contain running lights.

Bubble pipes measure washer levels which are indicated on the washer symbols, while shower water flows are shown just above the washer

(Continued on page 858)

Matching load and drive characteristics

C. G. HELMICK*

Part II—Drive characteristics in paper mills

SHIFTING attention from load characteristics for the moment, an examination of drive characteristics is in order. Drives for adjustable-speed operation must be described by two curves. The first can be termed the characteristic curve, which is the familiar speed-torque curve or family of curves. This describes the ability of the drive to meet load demands, including momentary or peak requirements.

The second curve can be called the capability curve, which describes the maximum continuous load which the drive is capable of carrying at any speed in its operating range. The capability curve is usually a thermal limitation of the drive. The reason for this twofold classification is that the drive motor will develop only as much torque as the load demands, regardless of its capability to deliver more. Thus load variations will occur along the characteristic curve even beyond the capability limit, if the load demand is not sustained continuously.

The inherent characteristic and capability curves of common adjustable-speed drives are shown in Fig. 6.

The d-c drive with armature-voltage control (Fig. 6a) is seen to have a constant-speed characteristic curve, and a constant-torque capability curve. Constant torque arises from constant flux and constant maximum current. (Torque = Flux × Current.)

The d-c drive with field-weakening control (Fig. 6b) has a constant speed characteristic curve with a constant-horsepower capability curve. Constant horsepower is implied by constant line voltage and constant maximum current. (Power = Volts × Amperes.)

The Rectiflow adjustable-speed a-c drive (Fig. 6c) has constant-speed characteristic curves. It is built to heat a capability curve that is either constant-torque or constant-horsepower, depending on the application to be made.

The characteristic curves of Fig. 6d show the constant-torque nature of the eddy-current coupling drive. Its upper capability curve is set by the maximum excitation, hence torque, and the lower curve, by its ability to dissipate the very high heat losses at lower speeds.

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Modification of drive characteristics by regulators

Since adjustable-speed drives furnish a limited number of inherent characteristics, it is sometimes desirable to modify these characteristics to match a particular load requirement. Regulators or other special controls can be used in this way to increase the flexibility of a basic drive. Furthermore, the inherent curves of these drives may not be sufficiently precise for process or quality control requirements, in which case the regulator can supply the necessary precision. Obviously, an unregulated drive is simpler and less expensive than a regulated drive, and should be used where possible. If a regulator is required, however, the drive may take on an entirely new set of characteristic curves.

Speed regulator

A tachometer can be used to measure actual drive speed and, with proper regulating elements, can correct drive speed to keep it precisely constant. The result is shown in Fig. 7, where the effect of the regulator is to remove the speed drop from the unregulated characteristic curve. It is interesting to note that little modification is required of the d-c drive (Fig. 7a), whereas a drastic change takes place with the eddy-current coupling (Fig. 7b).

Current regulator

This type of regulator when used with an adjustable-voltage d-c drive, as shown in Fig. 8, produces a drastic

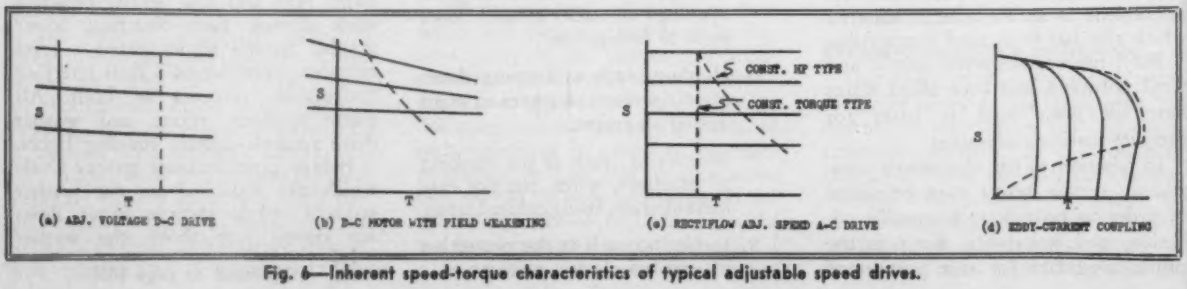


Fig. 6—Inherent speed-torque characteristics of typical adjustable speed drives.

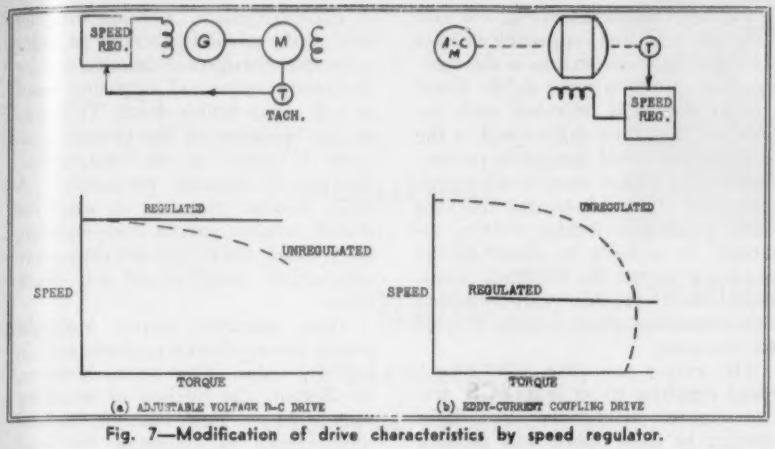


Fig. 7—Modification of drive characteristics by speed regulator.

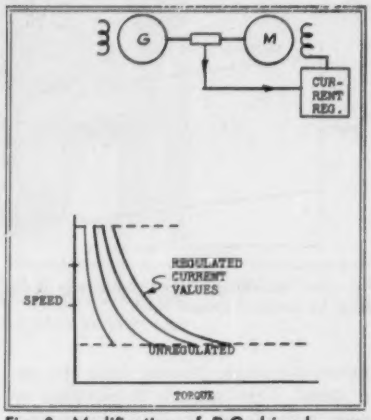


Fig. 8—Modification of D-C drive by current regulator.

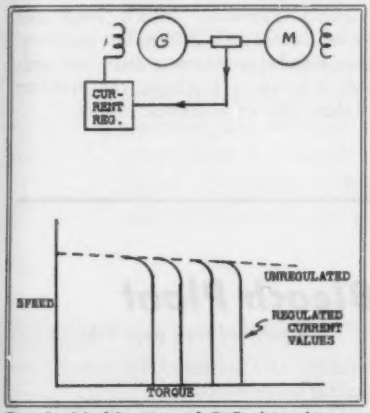


Fig. 9—Modification of D-C drive by current regulator.

change from the unregulated curve. The new characteristic curves are constant-torque, since motor torque is proportional to current for a fixed value of excitation. Different values of regulated current produce different constant-torque curves as shown.

The same regulator when used as shown in Fig. 9 also forces a drastic change. The new characteristic curve is constant-horsepower, resulting from a fixed voltage and constant current. Again, different values of regulated current produce different values of horsepower.

Dancer regulator

The use of the dancer mechanism to establish sheet tension was discussed under tension characteristics. The dancer can be further utilized to provide a control signal to regulate the relative speed of one motor with respect to another. The position of the dancer mechanism is directly proportional to the angular difference between the pullrolls and holdback rolls. Thus, if the position of the dancer is maintained constant by means of a dancer regulator, the controlled drive will be synchronized with the other drive. Such a scheme is shown in Fig. 10.

Matching examples

Washers

For removing the liquors from pulp stock received from the digesters, washers are used which consist of rotating cylindrical screens, upon which the raw stock is deposited. Water is sprayed on the outer surface, with a vacuum system drawing the wash water through to the inside of the screen. The loading of the washer drive over a typical 4:1 speed range, will be essentially constant-torque, but will depend on the thickness of stock and the operating vacuum used. Thus a drive whose capability lies between constant-torque and constant-horsepower offers advantages of operating flexibility.

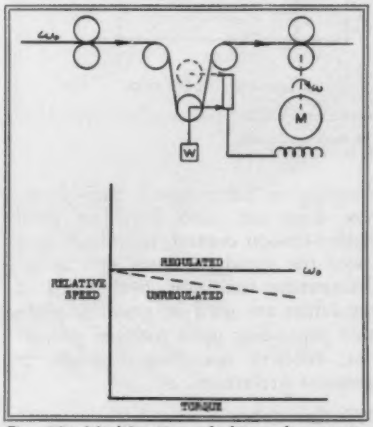


Fig. 10—Modification of drive characteristics by dancer roll regulator.

One such drive is the Rectiflow a-c adjustable-speed drive, whose reserve torque at lower speeds matches operating requirements nicely. For a given speed setting and vacuum adjustment (Fig. 11), the intersection of load and drive characteristic curves is very stable. Variations in vacuum or other loading will produce very slight speed change because of the flat speed-torque curve of the Rectiflow drive.

Printing press

Large newspaper presses are good examples of constant-torque loading. A multiplicity of impression cylinders, ink rolls, forming rolls and guide rolls, is used to carry the lightweight sheet of newsprint through the press sections. The loading is predominantly friction, with a slight windage component at high speed. The operating requirements are satisfied by: fairly constant speed, 2:1 production speed range, very low threading speed, and fine acceleration control to avoid sheet breaks.

An adjustable-voltage d-c drive is commonly used, especially since several simliar section drives may be fed from the same generator. The intersection of drive and load curves (Fig. 12) results in very stable operation. Variations in load torque, which might result from different cylinder or

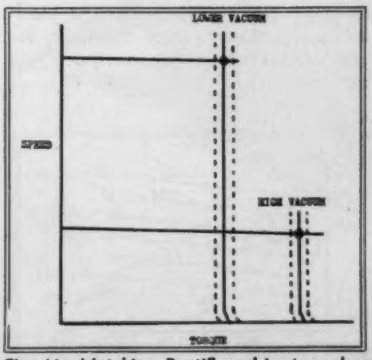


Fig. 11—Matching Rectiflow drive to washer load.

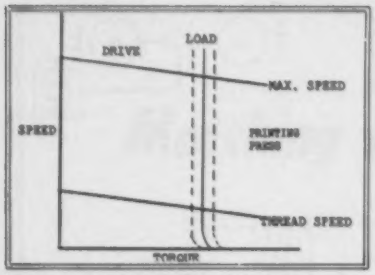


Fig. 12— Matching adjustable voltage D-C drive to constant torque load.

inkroll pressures, produce little change in speed. Very smooth acceleration is made possible by gradually increasing the d-c voltage applied to the drive motors.

Stretching machine

Heat setting requirements of certain man-made fibers require several pullroll sections to operate together, some pulling and some holding back. Requirements include: constant tension; reasonably constant speed; and in the case of holdback tension, the ability to absorb power. Two approaches are often encountered, one using a current regulator, and the other using a speed regulator. In either case, one section of the stretcher is designated the Lead section with the others pulling against it. The Lead section is usually speed-regulated to establish overall production speed.

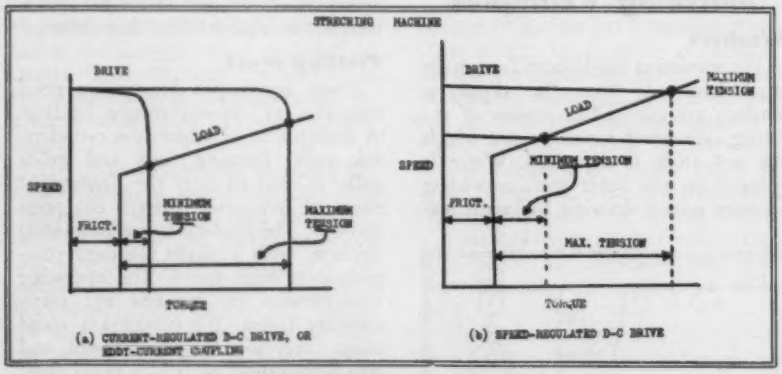


Fig. 13—Matching drives to tension loads.

The first case shown in Fig. 13a uses a current-regulated, adjustable-voltage d-c drive. The intersection of the characteristic curves is quite stable. Good tension control is provided, with the sheet serving to tie drive speed to the Lead section. Small changes in production speed produce little or no change in tension. The eddy-current coupling drive presents a similar picture, although its inability to absorb power precludes its use on holdback loads. Both drives provide well-controlled stalled tension, which is quite helpful for threading.

The second case (Fig. 13b) uses a speed regulator to set tension. A precise regulator is required since slight changes in drive speed will produce large fluctuations in tension. The intersection of load and drive curves shows very high stabilizing forces in response to disturbances. (Paradoxically, this can result in overshooting and oscillations if there is insufficient damping in the system.) Such a system does not lend itself to good stalled-tension control, because at zero speed the speed regulator sees an indeterminate condition. Both types of regulators are used in practice, probably depending upon material properties, different operating methods, or personal preference.

Winder drive

Modern high-speed winders are comprised of two motor-driven windup drums with electric unwind generators on the center-driven backstand. Good tension control must be provided at the backstand as the diameter of the unwind roll decreases. Exacting acceleration and deceleration performance is demanded to minimize idle production time, while at the same time holding sheet tension within limits.

An adjustable voltage d-c drive is used to accomplish these functions. Controlled buildup of generator voltage provides fast, linear acceleration. A current-regulator working into the field of the unwind generator provides a constant-horsepower characteristic by decreasing torque and increasing speed as roll radius builds down. This constrains operation of the unwind generator to points on the constant tension curve discussed previously. (A series booster generator is used for stalled tension, inertia compensation, etc.) Good, stable, characteristic-curve intersections result at all roll diameters.

These examples merely highlight a very few applications encountered in industry today. They serve, however, to illustrate the method of attacking such problems. First, examine the load requirements to determine the load characteristic curves. Second, examine the available drive characteristics for possible solutions. Match load and drive curves to determine performance suitability. If more than one suitable solution is available, the problem is then one of economic choice.

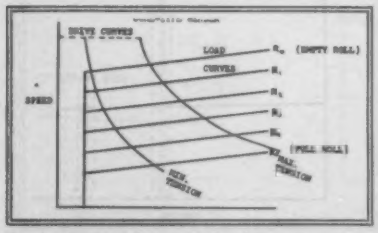


Fig. 14—Matching D-C drive to time-changing load.

Bleach Plant

(Continued from page 855)

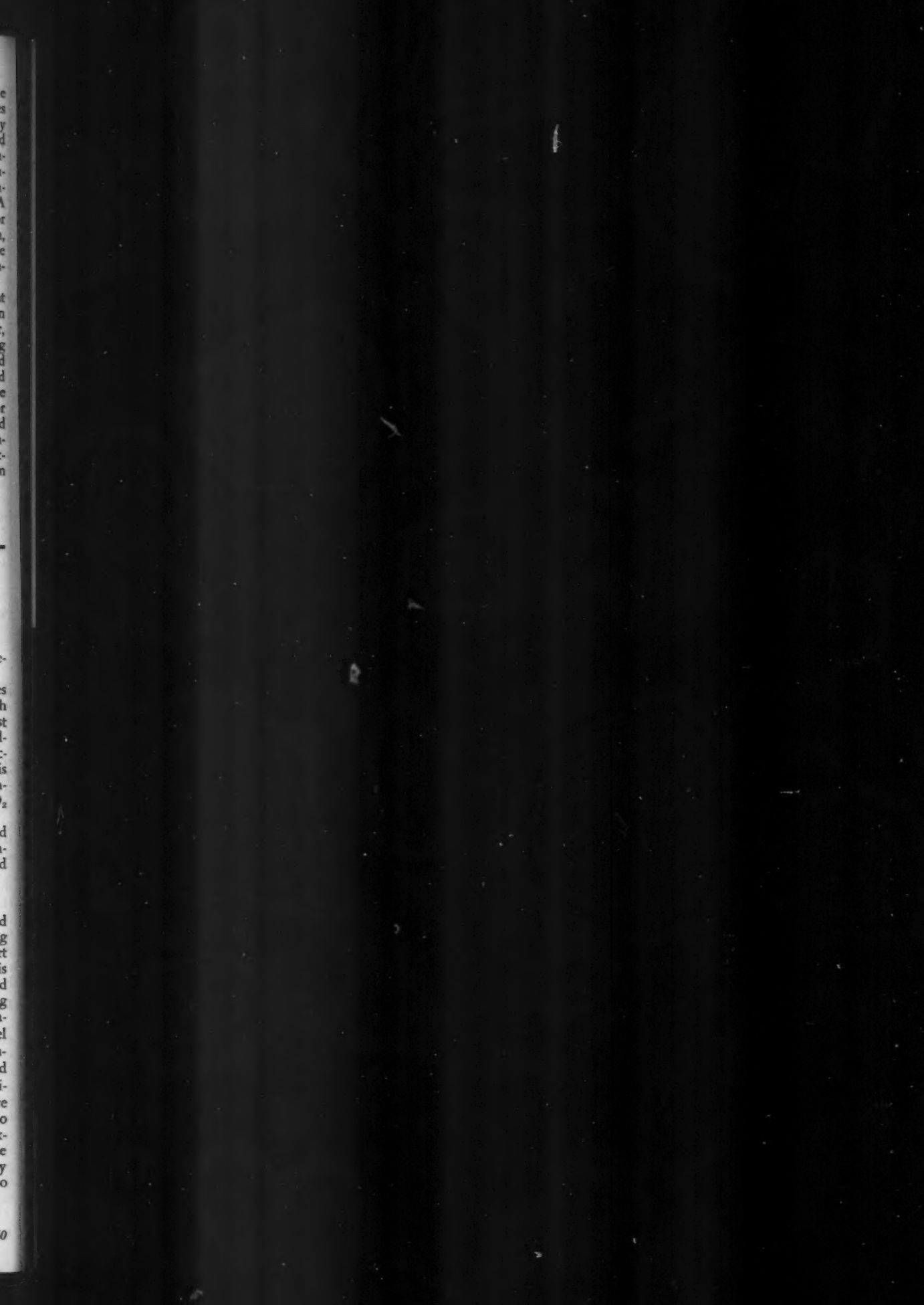
symbols and adjusted by simple reducing valve knobs.

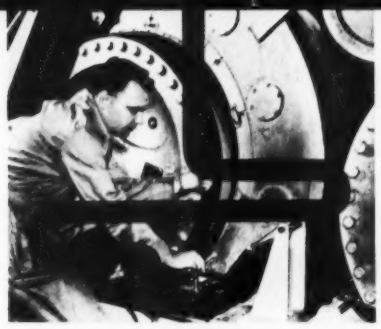
The instrument system also includes several interesting control loops, such as ORP control of chlorine to the first stage, a cascade system used to adjust ClO_2 to the fourth stage in accordance with the flow of stock to this stage, and a flow ratio system to control the air supply to the two ClO_2 reactors.

A compressor supplies compressed air for the pneumatic instrument control system and also for unloading and handling of sulfuric acid.

Heating and ventilating

The bleach plant system is served by complete heating and ventilating systems including summer comfort ventilation. Five separate areas in this system are pressurized with filtered air. The air system on the operating floor is designed to prevent condensation on the roof and structural steel during cold weather and summer comfort in warm weather. The hood and exhaust ductwork for the chlorine dioxide generators are made of fibre glass with the discharge arranged to prevent accidental re-entry of the exhaust fumes into the fresh air intake for the other systems. An emergency exhaust fan is provided in addition to the regular hood exhaust.





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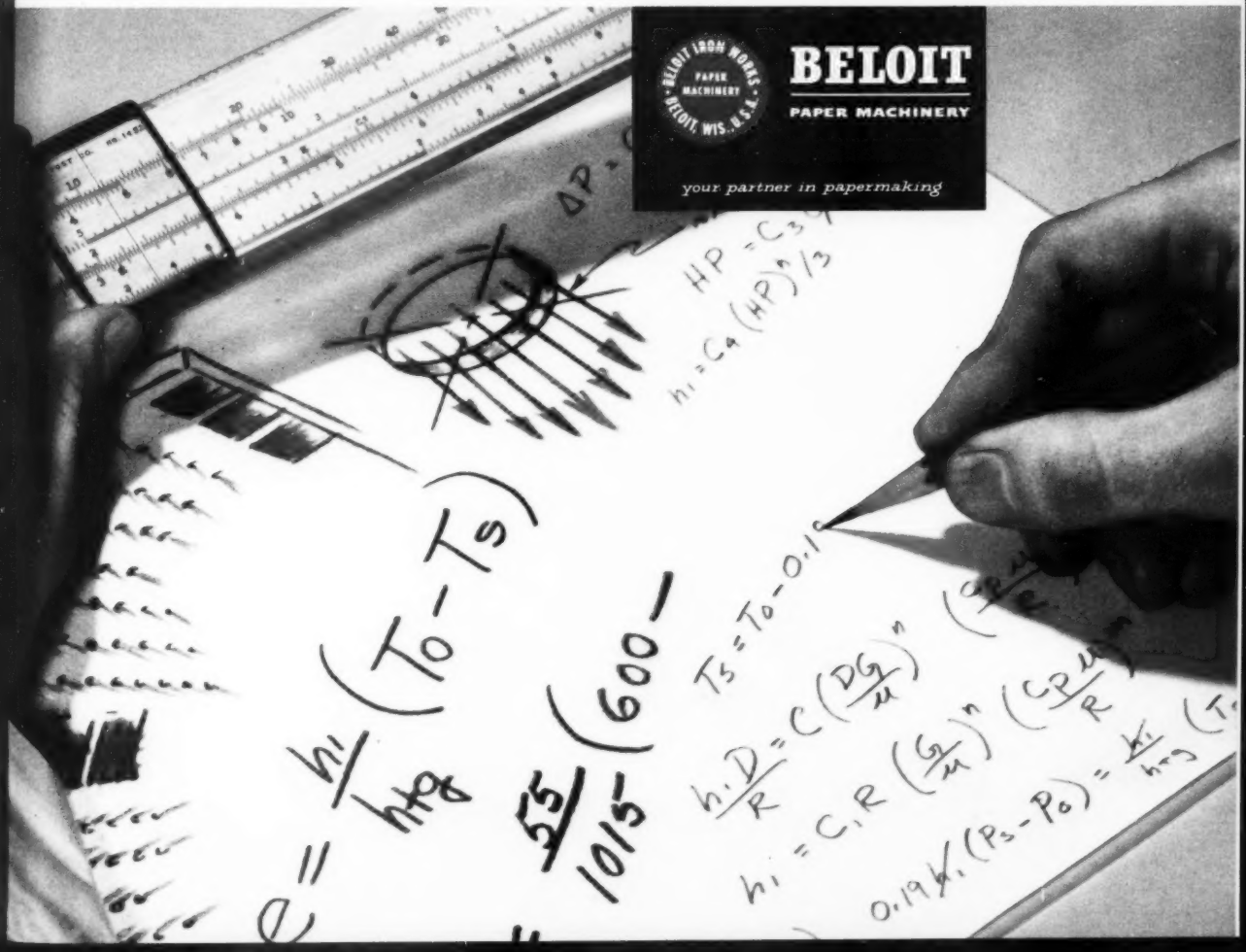
DRAWING-BOARD PORTRAIT: PREFIGURATION OF THE BELOIT AIR CAP. PHOTOS BY S. R. CHRISTENSEN



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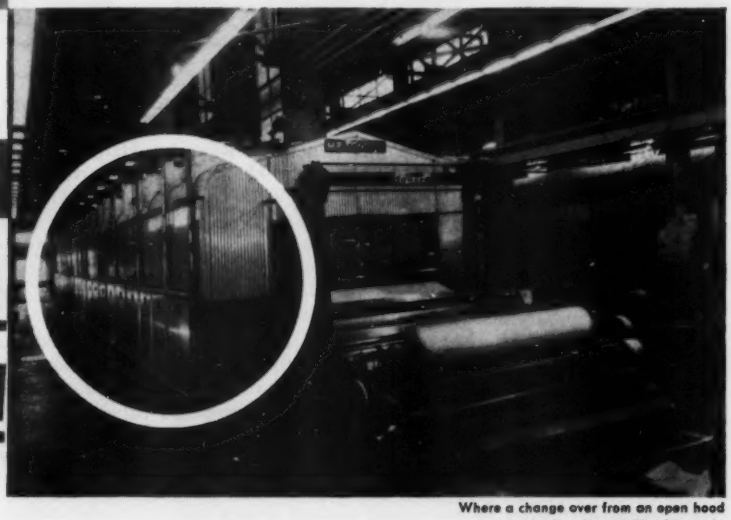

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High optimism characterizes 45th Annual TAPPI Meeting

James R. Lientz
reelected TAPPI president

THE 45th Annual Meeting of the Technical Association of the Pulp and Paper Industry, held in New York between February 22-25, was marked by a high feeling of optimism and a record breaking attendance of over three thousand registrants.

Both James R. Lientz, Tappi president, and Phillip Nethercut, Executive Secretary of Tappi, stressed at the annual business meeting the Association's rapid increase in membership which now stands at 10,154. The Tellers Committee announced at the annual meeting the reelection of James R. Lientz as Tappi president and Harold M. Annis as Tappi vice-president. Newly elected members of the Tappi Executive Committee are: Kenneth D. Running, Halifax Paper Co.; John M. McEwen, Weyerhaeuser Timber Co.; James R. Lientz, Union Bag-Camp Paper Corp.; Horace A. Spencer, Knowlton Bros.; Alfred H. Nadelman, Western Michigan University; and Harold M. Annis, Oxford Paper Co.

The Tappi Medal, awarded annually for significant and outstanding contribution to technical progress in the pulp, paper, and paperboard industry, went to Dr. Louis Wise of the Institute of Paper Chemistry. The medal was presented to Dr. Wise by Dr. Harry F. Lewis, vice president of the Institute.

Fourdrinier session

H. H. Mullins, Olin Mathieson Chemical Corp., discussed rope carrier practices which includes the single-, double-, and three-rope systems. Rope life is primiarily depend-

Seen by our camera

Dr. Louis E. Wise receives TAPPI Medal from Dr. Harry F. Lewis (left).

T. L. Yocum (E. D. Jones Corp.) and W. D. Boggess (Beveridge Paper Co.).

C. F. Holderle (Anheuser Busch) R. C. Melvin (Watervliet Paper Co.) and G. B. Walker Jr. (Procter & Gamble).

Karl Gothner, R. S. Dahlquist, and Lars Blomgren (American SF Products).

Alrick Man (P.T.J.) and Oliver Laakso (Kamyr Inc.)

S. T. Orton Jr. (Union Associates) and Burke Morden (Morden Machine Co.).

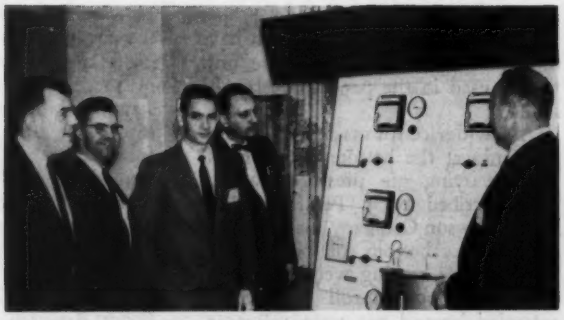
Harry Moore (President, Beloit Iron Works); E. D. Beachler and Bill Goodville (Beloit).

Herb Rowe (Nekoosa-Edwards); J. C. Redd (Mead Corp.) and Stephen Kudohch (Fitchburg Paper Co.).

John Graciano (Pioneer Paper Corp.); J. H. Fellow (Timken Roller Bearing); B. P. Astley Jr., and B. F. Perkins (B. F. Perkins Co.).

John Gilbert, Maynard Belden, and Art Hayes (International Paper Co.).

B. Armstrong (U. of Florida); John Dillon and Bert Starrett (French Oil Mill Machine Co.).



Robert F. Barber (Mgr. of Pulp and Paper Div., Foxboro Co.), 4th from left, explains continuous stock blending.

Arthur W. Bragdon (Cumberland Mills); Richard Porter and W. H. Chandler (S. D. Warren Co.).

T. A. Reiter and John Maxson (Stebbins Engineering Co.); and R. E. Crossley (Great Northern Paper Co.).

W. F. Boardway (Copper & Tank Works); John Cousins and F. B. Harlow (Penobscot Chemical Fibre Co.).

P. Dunlap (SKF Industries); H. B. Harris Jr., (Union Bag-Camp Corp.); and G. M. Campbell (Chicago Bridge & Iron Works).

Huber Newcomb (Manchester Machine Co.); E. W. Petrich (Howard Paper Mills); Harold Lerch and Ray Bennett (Chemical Linings Inc.).

Bill Mazarella and V. B. Doherty (National Starch & Chemical Corp.); B. G. Stumberg and A. W. Ayles (Southern Sizing Co.).

ent on proper tension, well designed correctly aligned sheaves, and proper splices. Spun nylon ropes, which have the advantage of long life, are now widely used in the paper industry, he said.

A new device for maintaining a uniform nip at the bottom calender roll under varying nip pressure loadings was described by J. Perkins of the Black-Clawson Company. Basically this consists of a bottom roll bending device and the bearing weight compensators. The bottom roll journals are extended beyond the main roll bearings on the tending and drive sides and the outside roll bearings are connected to floor-mounted hydraulic cylinders which can load the journals up or down and thereby control the amount of crown in the roll.

As announced by Frank Peterson, president of Black-Clawson Co., this principle will be applied by the company on new machines and will permit the installation of crown-less rolls on the paper machine. Among the advantages will be (1) uniform water removal, (2) longer felt life, (3) uniform nip under all load conditions, and (4) even caliper control of sheet.

Acid pulping

W. J. Darmstadt, Babcock & Wilcox Corp., and G. H. Tomlinson, Howard Smith Paper Mills, discussed the advantages of magnesia base pulping as a result of recent simplification of processing in the liquor make-up stage and recovery operations. The capital cost and pulp production costs for the magnefite process were described as attractive when compared with those of kraft pulping.

The application of the atomized suspension technique to the recovery of spent sulfite liquor was described by Dr. W. H. Gauvin of the Pulp & Paper Research Institute of Canada, with emphasis on the practical experience in this application gained during the past year. Other recovery systems discussed at the meeting were the Western Precipitation Process described by R. Q. Boyer, the Mead Process described by H. P. Markant, the Sivola Recovery Process, described by E. H. Kennedy of Combustion Engineering, and the Stora Kopperberg Process, described by K. N. Cedarquist, K. Ahlborg and B. O. Lunden.

Mechanical pulping

A mechanical compression-decompression technique in the impregnation of hardwood chips and a novel screening operation were described by H. L. Crossby and N. N. Coe, Dorr-Oliver Inc. The process, characterized by a low horse-power requirement, is fully continuous.

E. R. Gremler and J. N. McGovern, The Black-Clawson Co., described a new high density defibering machine known as the Chemifiner which has two revolving discs with offset centers. Its main advantages are: (1) low horse-power requirement of 9-13 hp per day per ton, (2) improved quality of well-defibered, high freeness cold soda pulp with good strength characteristics, and (3) bamboo pulps can be produced with especially high tear strength.

Pulps obtained from cooking chips for 5-10 minutes at 150 psi steam pressure and showing strength equivalent to those of fully cooked pulp were reported by D. A. Feigley and M. J. Showalter of Armstrong Cork Company. The optimum pH for maximum strength development was about 3.5. The unexpected strength development was attributed by the authors to the presence of organic acids of certain acid strength.

Paper drying

A new high-velocity air dryer, designed for use over the dryer rolls to achieve cross-machine moisture profile corrections, was described by R. A.

(Continued on Page 906)

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83rd APPA meeting revealed optimistic views for "Surging Sixties"

WARREN B. BULLOCK

To what extent will the Paper Industry be able to realize its maximum potential in the Surging Sixties?

This was the underlying motif at meeting after meeting of the American Paper and Pulp Association and its dozen affiliated divisions during Paper Week which opened February 22 at the Waldorf Astoria in New York.

Economists and industry executives both sought the answers by peering into their individual crystal balls. In the addresses delivered at different gatherings, the tone was generally optimistic, but somewhat guarded at times.

The week concluded with a final roundup in an open session at which the problems of the industry were carried by various speakers, beginning with the raw material supply problem, through the possibilities of technical research, to the development of new uses and better distribution and therefore increased sales.

Decade of decision

In the open meeting, Richard E. McArdle, chief of the United States Forest Service, said that the industry's problem is that eventually there will not be enough land on which to grow pulpwood. Dr. Alfred Nissan of Renssalear Polytechnic Institute, advocating expanded research, told the industry its foresters should follow the example of the citrus fruit industry which found how to grow oranges without seeds, by growing trees without bark or lignin. C. L. Van Derbogart, president of the National Paper Trade Association, said that by adequate salesmanship, the industry could develop markets for new products and for more expanded use of existing grades, and concluded by saying, "the time is right to sell more paper".

Even before Mr. McArdle told the industry at the open meeting that the Sixties are the decade of decision when the industry must determine whether trees are to be grown now to meet future requirements, Howard E. Whitaker, chairman of Mead Corp. and the newly elected president of the Association, told a press conference that the industry expects that in the next ten years, present acreage will be so scientifically managed that twice as much timber will be grown. Even now, he said, the industry is growing trees faster than they are being cut to meet the needs of the mills.

Again anticipating the address given later on research, Mr. Whitaker, himself originally a research engineer, said that while the industry is now spending fifty million a year in research, only one per cent of its sales dollars, it will soon catch up with the chemical industry which spends four per cent of its income in this field.

Future production

There was little difference in the opinions expressed as to the future capacity and production throughout the next ten years. All agreed that production, which totaled 34 million tons of paper and paperboard in 1959, will reach a capacity of forty and a half million in 1970, the latter figure being projected on an annual operating year of 313 days. Present capacity, according to Benjamin Slatin, the Association's economist, is 40 million tons, if the mills operate at their maximum number of working days. Using these figures, Robert E. O'Connor, executive secretary of the Association, said that in three years consumption will rise 10 per cent or 3 million tons.

On the other hand, at a press conference, John R. Kimberly, retiring Association president, said that while expansion continues in the industry, there is now sufficient capacity to meet the needs for the 1960-65 period. Morris C. Dobrow, executive secretary of the Writing Paper Association, envisions production of 36 million tons in 1960, a ten per cent increase over 1959, as compared with a total output of 9 million tons in 1925. At the same meeting, Dexter M. Keezer, economist of the McGraw-Hill organization, said that the coming decade

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will be the most entertaining and invigorating of any in the paper production field for which records are or will be available.

Views on Russia expressed

Two views of the Russian menace to the paper industry were expressed at different meetings. Dr. Joseph E. Atchison, in telling of his prolonged survey of the Russian paper industry before the Pulp Association, said that Russian mills are twenty years behind the United States in methods, machinery and "know-how". He said that a very large proportion of Russia's pulp production will go to the home market, while conceding, but considering it unlikely, that some might be exported to give Russia the much needed foreign currency. Eric Lagerloef, however, before the Export Committee of which he is secretary, said that Russia's need for dollars would doubtless lead that country to export pulp at prices below world quotations.

Future in pulpwood

The importance of Paper Week to the industry can be appreciated when it is pointed out that attendance at meetings of the paper manufacturers groups has become so great that one affiliated organization, the American Pulpwood Association, found it necessary to transfer its three-day convention to another hotel, the Roosevelt. Not only did this pulpwood group discuss technical aspects of garnering the pulpwood crop, but there were addresses relating to research in the forestry field. The availability of hardwoods is coming to be more and more a possibility and one speaker told of the success of the new process for making newsprint from these woods. He called hardwoods "The Fiber of Today", and said that this development would be particularly important for the erection of new mills in nations which are not blessed with softwood species.

Added notes of interest from meeting

Export committee

At an open meeting of the Export Committee, **Elliott Haynes**, editor of Business International, stressed the need for intelligent planning for future business opportunities in foreign countries. This planning will require an escape from several basic assumptions on which most U.S. business has based high corporate policy for 40 years.

The U.S. company, for an example, that places its major reliance on exports from U.S. to expand its international profits will fall behind.

Many U.S. corporations have gone international. They have seen the necessity of building production, sales and profits abroad in volumes even larger than those in the U.S. They know there are ten times as many people (consumers) in the free world outside the U.S. They also know that every country is eager to create its own industrial plants, and that if U.S. industry does not do it for them, others will. These companies know that in doing these things, they are working in the best interests of the U.S. and the free world.

"I hope that your industry", stated Haynes, "will exercise increasing ingenuity, for example, in studying ways to utilize new raw materials abroad that are sometimes the only resource an impoverished nation seeking a paper industry has, such as is now being done with bagasse and esparto grass. It is eminently necessary and advantageous for U.S. companies to set as a goal for the "Sixties", the building of international business to levels higher than at home—through exports, licensing and foreign investment. In so doing, they will earn maximum profits, serve the great needs of the corporation and its shareholders, contribute the balancing of our international accounts, and strengthen the nation and the free world".

Developments in Russia

Eric G. Lagerloef, secretary for the Export Committee of APPA, gave a review of the developments in Russia's pulp and paper industry. The pulp and paper industry in Russia has been included with due emphasis in a seven-year plan for a broad industrial expansion which has its ultimate purpose—a marked increase in the standard of living for Russia.

The intensive modernization and construction program is underway in view of major machinery and equipment purchases covered in the recent trade agreements with both Sweden and Finland. The former, covering 1959-1961, includes $42 million of machinery and the latter 1960-1965, $75 million, both treaties also covering pulp mill installations and other industry equipment amounting to over a hundred million dollars. Equipment has also been contracted for in other countries.

Russia's export and import statistics show a steadily increasing upward trend in exports while imports indicate a "turning on and off" policy as dictated by what is considered suitable by the policy makers as negotiated in trade treaties.

Opinions have been expressed that five to seven years from now, Russia would make determined effort to break into world markets with products of her pulp and paper industry. Should Russia's meaningful threat, as expressed by Khrushchev, of overtaking U.S. production in all phases become reality; would it not be logical to take seriously the fact that Russia's massive potential could present problems earlier than anticipated, since her policies have usually been inimical to our country's interests!

Materials situation

In discussing the "Dynamic Elements in the Materials Situation", **J. Roger Wallace**, associate editor of Commodity Economics for the Journal of Commerce, brought out that 1960 as a whole, is expected to be a year of very high level demand for materials, although probably not so high as some of those extremely optimistic business forecasts late last year might have led one to expect.

In analyzing the outlook for materials prices, he added, we must allow for the possibility of a moderate amount of easing during the next six months or so from current very high levels of business activity here in the United States. But even at the end of six months, business still would be at high levels, in all probability.

The world as a whole is chewing up materials in its factories at a record high pace, and the pace could continue upward even in the event of some slackening in demand in the U.S. Supplies of materials generally are adequate. There are few surplusses. At the same time, there are few shortages.

It appears that inflationary forces in our economy still are strong, even though they may not be quite so

strong as was generally believed late last year. But in Wallace's opinion, inflation long prolonged, tends to breed deflation. We must be ever alert, he said, to the possibility that the trend of price level may not continue to be a one-way street indefinitely.

Materials management

Paul V. Farrell, editor of Purchasing Magazine, in his address to the committee stated that materials management is still one of the least understood and least recognized major functions of business.

As a company grows, materials management responsibility is spun off in several directions. One element, the determination of requirements is handled, at an early stage in the company's history, by the shop foreman or superintendent. This job is eventually taken away from line supervision and given to a separate production control department. Responsibility for the buying phase is passed, by degrees, directly to a purchasing specialist. Both departments grow and absorb related functions. The end product in many cases—conflicting objectives and strained working objectives.

While it is true that the materials organizations of today are far from perfect, they are tremendous improvements over those that prevailed 50 years ago. But superior forms of organization will continue to evolve.

Donald S. Adams, manager, materials department, Ohio Division of Champion Paper & Fibre Co., in discussing "the materials handling and the materials management concept in the pulp and paper industry, stated that the paper industry can not afford to play down the material handling function in materials management. There is still a tremendous potential for material handling savings in the paper industry.

Adams feels that only with a full-time material handling engineer, can industry do an adequate job in reducing handling costs.

Centennial celebration

The Writing Paper Manufacturers Association, which is the oldest national trade association in the United States, held its 99th annual meeting during Paper Week. A reception was given to mark the beginning of the 100th year of the Association.

The Association was founded in Pittsfield, Mass., on February 13, 1861. It is composed of 90 U. S. manufacturers of business, correspondence and technical papers. Four of the original companies which organized the Association, are still in operation and still members of the organization.

At the 99th meeting, plans were made for the celebration of Centennial next year, in which a salute to the writing paper industry will take place during Paper Week of 1961.

M. C. Dobrow, executive secretary of the WPMA, announced at the reception that in 1860, the daily output in the writing paper was 76,950 lbs. and its daily output in 1959 was 11 million lbs.

Dobrow added: "In a century of change and growth, the association has provided a continuous program of sound economic information, cooperation and service for the benefit of the industry and for the benefit of the public".

Greater role in logging

Scientists and mathematicians may soon be playing a more important role in logging if the forest industry expects to meet increased competition.

This forecast was stated by **Dr. L. J. Lussier,** operations research director for Quebec North Shore Paper Co., at the annual meeting of the American Pulpwood Association.

The financial success of the logging industry will always lie on the experience and judgement of the intelligent woods manager, he said.

Operations Research is a method of solving practical problems through mathematical formula based on performance analysis of any given operation. The method has been successfully applied to problems of: production and cost control; production planning; machinery replacement and allocation; inventory control; work methods analysis; and communication problems.

APPA officers for 1960

H. E. Whitaker, (right) newly elected president of APPA for 1960, accepts gavel from retiring 1959 president, John R. Kimberly.

PRESIDENT—H. E. Whitaker, chairman of the board of Mead Corp., Dayton, Ohio.

FIRST VICE PRESIDENT—Reuben B. Robertson Jr., president of Champion Paper & Fibre Co., Hamilton, Ohio.

VICE PRESIDENTS—W. R. Adams, president of St. Regis Paper Co., New York; M. D. Bardeen, president of Simpson Lee Paper Co., Vicksburg, Mich.; Alexander Calder Jr., president of Union Bag-Camp Paper Corp., New York; W. H. Chisholm, president of Oxford Paper Co., New York; R. C. Doane, president of International Paper Co., New York; R. F. Erickson, president of Rayonier Inc., New York; Robert Faegre, president of Minnesota & Ontario Paper Co., Minneapolis; J. L. Madden, vice president of Scott Paper Co., Chester, Penn.; M. C. McDonald, president of Great Northern Paper Co., Bangor, Maine; Howard W. Morgan, vice president of Pulp, Paperboard and Container Group, Weyerhaeuser Co., Tacoma, Wash.; R. J. Sund, vice president & general manager of Marathon, Menasha, Wis.; Samuel R. Sutphin, chairman of the board of Beveridge Paper Co., Indianapolis; G. J. Ticoulat, senior vice president of Crown Zellerbach Corp., San Francisco; R. W. Wortham Jr., executive vice president of Southland Paper Mills Inc., Lufkin, Texas.

EXECUTIVE SECRETARY-TREASURER—Robert E. O'Connor.

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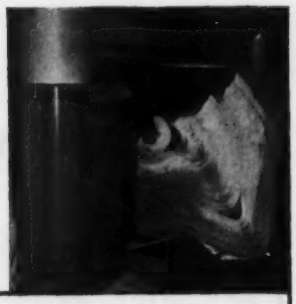

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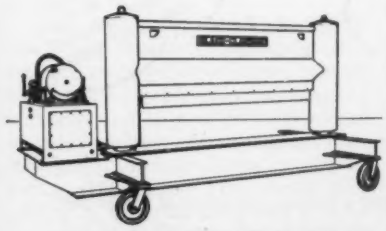
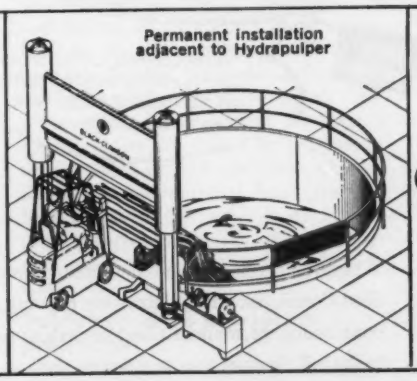
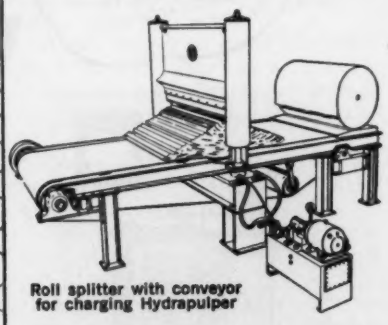


Portable roll splitter for use in several locations



Permanent installation adjacent to Hydrapulper



Roll splitter with conveyor for charging Hydrapulper

Single Source for Stock Preparation Machines & Systems

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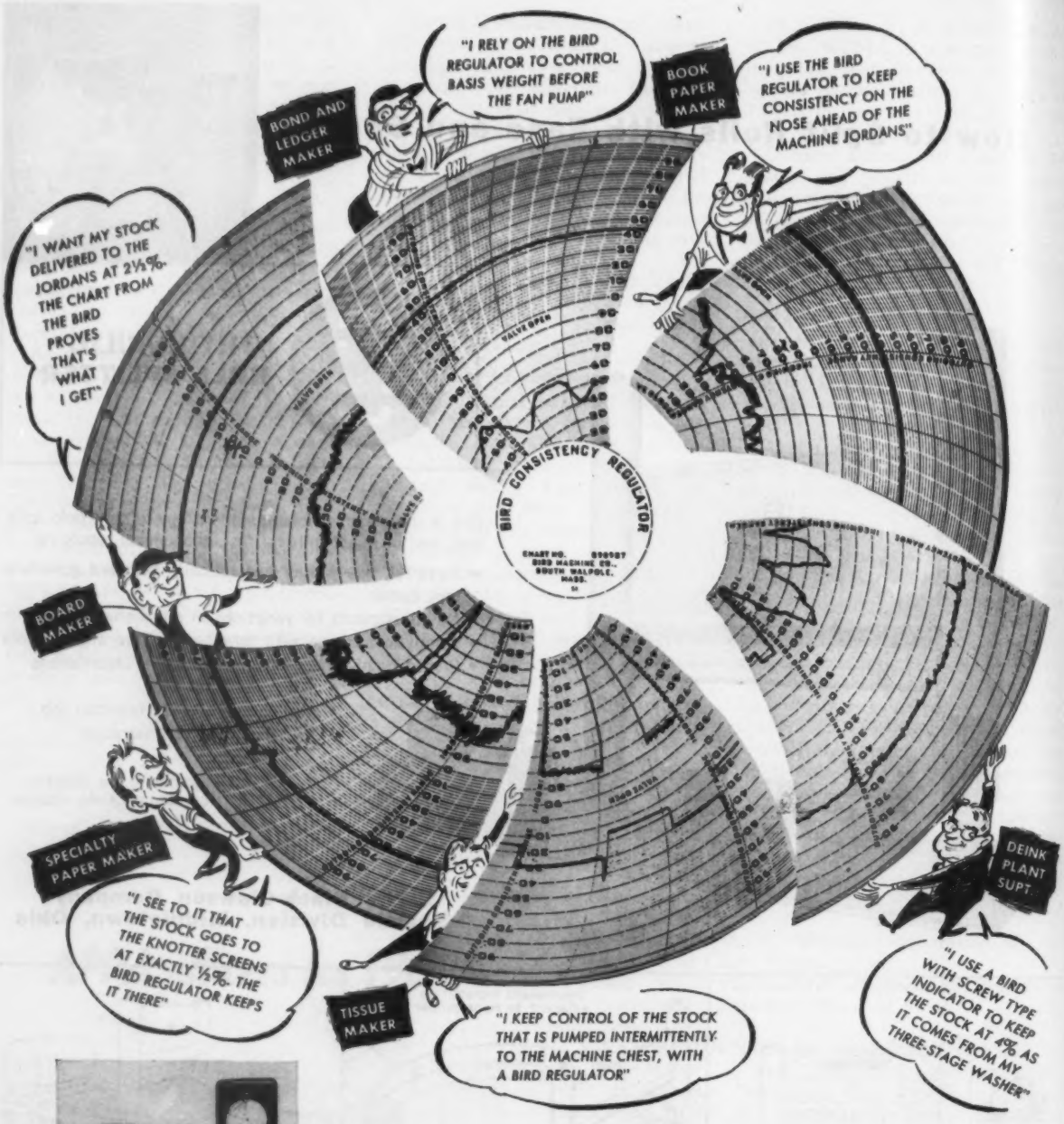
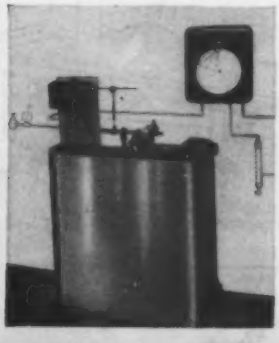

"I RELY ON THE BIRD REGULATOR TO CONTROL BASIS WEIGHT BEFORE THE FAN PUMP"
BOND AND LEDGER MAKER
BOOK PAPER MAKER
"I USE THE BIRD REGULATOR TO KEEP CONSISTENCY ON THE NOSE AHEAD OF THE MACHINE JORDANS"
"I WANT MY STOCK DELIVERED TO THE JORDANS AT 2½%. THE CHART FROM THE BIRD PROVES THAT'S WHAT I GET"
BIRD CONSISTENCY REGULATOR
BOARD MAKER
SPECIALTY PAPER MAKER
"I SEE TO IT THAT THE STOCK GOES TO THE KNOTTER SCREENS AT EXACTLY ½%. THE BIRD REGULATOR KEEPS IT THERE"
TISSUE MAKER
"I KEEP CONTROL OF THE STOCK THAT IS PUMPED INTERMITTENTLY TO THE MACHINE CHEST, WITH A BIRD REGULATOR"
DEINK PLANT SUPT.
"I USE A BIRD WITH SCREW TYPE INDICATOR TO KEEP THE STOCK AT 4% AS IT COMES FROM MY THREE-STAGE WASHER"



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CURRENT COMMENTS

APPA files for year delay on food and drug act

WARREN B. BULLOCK

In an effort to prevent, or at least delay, the "cranberry-izing of major segments of the paper industry, the American Paper & Pulp Association has filed a petition for a year's delay in putting into effect provisions of the Pure Food and Drug Act which would force paper companies to prove their products were harmless before allowing their use in food packaging. This is the Act under which government authorities are questioning the purity of red dyes used in lipsticks. In the case of cranberries, the government seized shipments which had been subjected to weed killing chemicals, because it was found that such chemicals could cause cancer in rodents.

In the case of paper, however, the industry is being called upon to prove in advance that migrant substances, such as waxes for milk bottles, starches, rosin size, and other components which might conceivably be transmitted to the foods with which they come in contact can not cause cancer or other diseases. How to prove the negative, is the problem which led the industry to ask that the new legislation be deferred one year from the original cut-off date of March 6, 1960.

The Food and Drug Act itself does not mention paper, but the inclusion of paper and paperboard comes from an interpretation by the counsel for the administration of the Act, when he stated:

"The legislative record specifically states that ordinary packaging materials used to preserve shape, prevent moisture loss, to prevent contamination with dirt and to provide convenience in use, handling and storage are neither foods nor food additives. Nevertheless, the record also shows that packaging materials composed of substances which migrate to the food may be subject to the safety provisions of the law. Plainly, a container designed for food use which contains a migratory substance of unknown or uncertain toxicity is a food additive. And we do not believe it will be necessary to wait until food is actually packaged in the unsafe container before we can start regulatory action to control its use. Such a container would be classified on the basis of its intended use of a food, as a food additive".

$4 Billion expenditure

The expenditure by the paper industry in new capacity totaled $4 billion in the seven-year period beginning 1953. This was announced by industry statisticians. In that period, production increased 40 per cent. The expenditures as reported by years are listed as follows: 1953, $409 million; 1954, $455 million; 1955, $518 million; 1956, $801 million; 1957, $811 million; 1958, $578 million and 1959, $625 million. The years 1960 and 1961 will add, at present estimates, another half-billion dollars to the enormous expansion total.

A survey of allocations of securities held by the nation's investment trusts as made by the National Association of Investment companies shows that common stocks of paper companies in the assets of these mutual funds total a value of $473,641,000. Out of this total, International leads the list with $183,737,000 held by 45 investment companies, and St. Regis is second with $36,141,000 held by 29 funds.

Publishers drop newsprint production

The old proverb about the shoemaker's sticking to his last, has proved valid in the instances where newspapers have tried to manufacture their own newsprint. The Knight newspaper syndicate recently sold its Norfolk, N. Y., mill to the Aco Machinery Co., and the James Kenney Foundation sold its Manistique, Mich., mill to Field Enterprises. Publishers bought into 13 paper companies after World War II. Eight of these mills have since gone entirely out of newsprint production, three now make this grade on a limited basis and only two continue to make this grade on a full time basis. Meantime, the United States newsprint mills are operating at top speed, doing their share to produce the record consumption of 7,103,785 tons used in 1959.

Increased imports

Sharply increased imports in December and for 1959 as a whole, cut the United States export-import trade surplus of exports to the narrowest margin since the end of World War II. Paper was among those imports showing a big increase. Imports of wood, pulp and paper rose to $1,675,800,000, up $250,000,000 from 1958. Of the total amount, something over $600,000,000 was in newsprint and well over $50,000,000 in dutiable papers and paperboards, the greatest volume of these imports in the industry's history.

Net incomes

Allied Paper Corp.—First nine months, $1,289,178; a year ago, $20,699.

Brown Co.—Year ended November 30, $714,203; a year ago, $1,295,631.

Celotex Corp.—Year ended October 31, $4,131,907; a year ago, $3,127,512.

Champion Paper & Fibre Co.—Nine months ended December 31, $7,613,450; a year ago, $5,693,614.

Chesapeake Corp. of Virginia—Year ended January 3, $3,909,640; a year ago, $2,916,215.

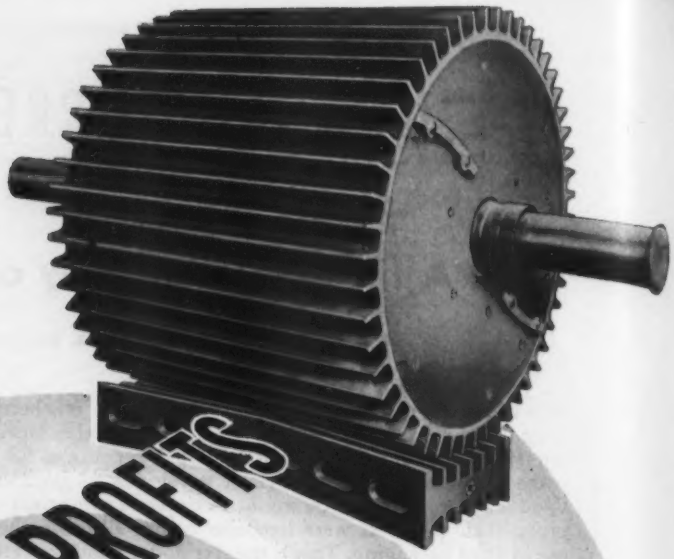
Crown Zellerbach Corp.—Net income in 1959, $39,329,000. This was the third best year in company's history. Income in 1958 was $33,234,000.

Keyes Fibre Co.—Income for 1959, $1,960,916; a year ago, $1,649,493.

Masonite Corp.—For quarter ended November 30, $1,551,476; a year ago, $979,787.

Oxford Paper Co.—Profit in 1959 was $2,290,000; a year ago, $2,655,726.

Rayonier Inc.—Income in 1959 of



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$13,350,000 more than tripled the 1958 earnings of $3,601,754. Sales reached a total of $129,500,000 as compared with slightly over $108,000,000 in 1958.

Riegel Paper Co.—Income for 53 weeks ended January 3, $2,623,468; a year ago, $3,000,416.

St. Regis Paper Co.—Income rose in 1959 to a record high of $28,600,000 as compared with $21,998,072 in 1958.

United Board & Carton Corp.—Income for 24 weeks ended November 30, $186,145; a year ago, $235,108.

Financial Notes

The unanticipated slump in Wall Street prices beginning in January was sharply reflected in the prices for paper company common stocks. An unusual development, however, was that while the prices of common stocks dropped sharply, the preferred issues generally showed strength.

Stock and Bond Quotations

New York Stock Exchange — Stocks

Closing Prices	February 10, 1960	January 11, 1960
American Can	40¾	42¾
Same Pref.	36⅜	36
Celotex	33⅜	34
Same Pref.	18¾	19
Certani-Teed	13¼	13⅜
Champion P. & F.	37	41¼
Same Pref.	* 90-92	* 88-88½
Chesapeake of Va.	* 39⅛-40	40½
Container	25⅜	27¼
Same Pref.	* 84-85½	* 82-82¼
Continental Can	43½	46½
Same Pref.	80	* 76-77
Crown Zellerbach	48½	52⅛
Same Pref.	86½	87½
Diamond National	31⅞	33⅜
Same Pref.	29	28
Federal Paperboard	41¾	42
Same Pref.	21½	* 21⅛-21¾
Fibre Paper Board	44⅜	45¾
Great Northern	46½	51
Hammermill	31⅛	* 32-32½
International	114½	132
Same Pref.	* 86-87	* 86½-87
Kimberly-Clark	63	68
KVP-Sutherland (New)	29½	—
McAndrews & Forbes	27⅞	* 28¼-29½
Masonite	35½	36½
Mead Corp.	40½	47¾
Same Pref.	* 86⅜-88	* 87¼-88½
Minnesota & Ont.	29⅞	32½
Oxford Paper	30	30¾
Rayonier	23¼	26¾
Riegel Paper	* 38¾-39	41⅞
St. Regis	45⅞	50¼
Same Pref.	* 89¼-90	88
Scott	74¾	78⅞
Same $4 Pref.	* 84-85	83
Same $3.40 Pref.	* 74-78	* 74-76
Sealright	36½	39¼
Standard Packaging	30⅞	34⅜
Same $1.60 Pref.	* 90½-100	*100-110
Same $1.20 Pref.	34¼	39
Union Bag-Camp	37⅛	40¼
United B. & C.	25⅛	26
U. S. Gypsum	90	92¼
Same Pref.	150	*151½-153
West Va. P. & P.	45¾	53¼
Same Pref.	* 92-94	* 93-95

New York Stock Exchange — Bonds

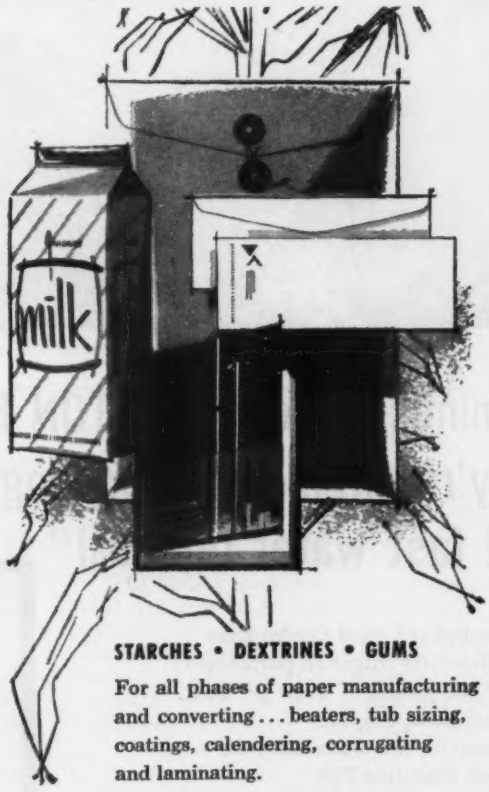
Champion P. & F. 4½%	106½	111¾
Champion P. & F. 3¾%	83	82
Diamond Gardner 4%	—	—
Kimberly-Clark 3%	87½	87
Oxford 4¾%	105½	108
Scott 3%	99	103¾

American Stock Exchange — Stocks

American Writing	32	31¼
Allied Paper	14	15⅝
Brown Co.	10½	11⅛
Puget Sound P. & T.	27⅛	25

*Closing Bid and Asked Prices

Look what happened to the corn we took off the cob



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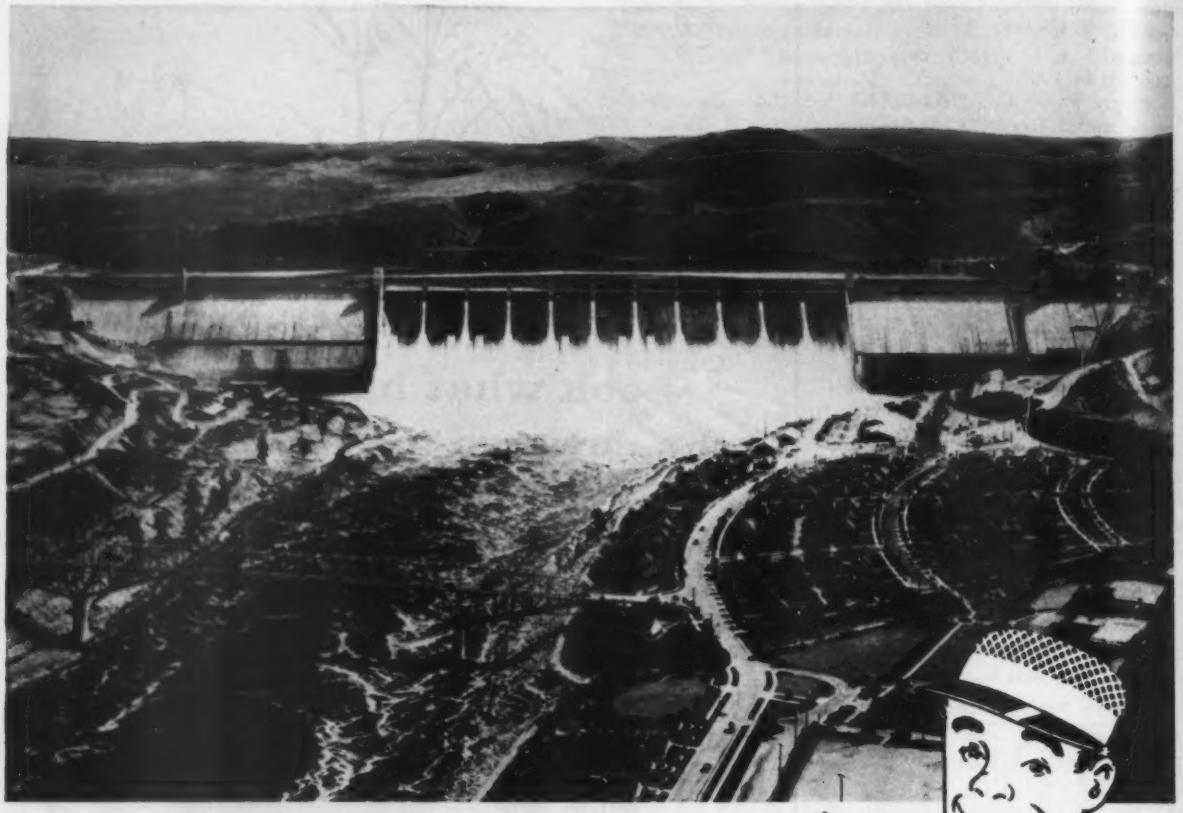
*Idea suggested by G. H. Stevenson, Empire, Oregon

Photo of Grand Coulee Dam, Washington State by Ewing Galloway, N. Y.



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and keep your machines running
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NEWS of the INDUSTRY

U.S. Publishers — Biggest Owners of Newsprint Production Facilities

It has been reported that U. S. publishers own wholly or in part, 14.6 per cent of North American newsprint production capacity — nearly 300,000 tons more than the largest manufacturer in the field.

Capacity of the mills which American publishers own outright or in which they hold an interest totals 1,430,000 tons. The North American potential tonnage total is just short of 10,000,000.

CZ Helps India in Paper Production Training

Crown Zellerbach Corp. has entered into an agreement with Rohtas Industries Ltd., Dalmianagar, Bihar, India, to provide technical assistance and personnel training in paper production.

In the agreement, Crown Zellerbach specialists will provide technical assistance to improve Rohtas' paper manufacturing operations. The arrangement also calls for on-the-job training of Rohtas personnel at Crown Zellerbach mills in the United States and Canada.

Rohtas Industries produces approximately 60,000 tons of paper a year. This is about 20 per cent of India's total paper production.

Entries Open for 1960 Annual Awards in Packaging

Entries are now being received for the 1960 Annual Awards of the Packaging Institute for outstanding contributions to packaging technology.

A Corporate Award is given annually in recognition of an outstanding advance in applied packaging technology to the company which has commercially integrated packaging materials, equipment and methods in the packaging of their product.

A Professional Award is presented to the individual who, because of his pre-eminence in, and contribution to the field of technology, is deemed worthy of special recognition.

Complete details and entry forms may be obtained from the Packaging Institute office. Deadline for entries is May 15.

General Aniline Relocates Home Office

General Aniline & Film Corp. has moved its home office, which has been at 230 Park Ave., N.Y., to new and larger quarters in the Time and Life Building located at 111 West 50th St.

The corporation is composed of three divisions: Ansco — producing cameras, film and other photographic materials and equipment; Ozalid — a manufacturer of whiteprint duplicating business machines and sensitized papers; and the Dyestuff & Chemical division.

Weighing Chipper Sawdust Pays Off

It has always been known that there is a direct connection between chipper efficiency, chip quality and the amount of sawdust produced by a chipper.

Although many mills have made random checks of the sawdust produced, no accurate answer has been obtained because of the varying volume of wood being cut, the chip screen arrangement and other factors. The mills have not had a continuous check on this important point of mill operation.

The rising cost of wood and other operating costs have made this an important point in the operation of all mills. At the Flambeau Paper Division of the Kansas City Star Company's mill, a simple continuous Scale and Recorder has been installed. This scale and recorder is read and recorded once per hour during the wood room operation. Each set of chipper knives is numbered and a record made of each knife change, of the number of cords of wood the knives cut and the amount of sawdust produced per cord.

It was quickly determined that the quality of knife grinding was the secret. By the end of the first five weeks of operation the sawdust produced had been dropped 1 per cent, or a savings of 2½ cords on a 250-cord-per-day operation. The only thing done was to give the knife grinder operator the sawdust report. Coupled with this, the cords of wood cut by one set of knives has increased from 71.5 cords to 125 cords. This is a 75 per cent increase in knife life. Of course, when knives come off the chipper in better condition, less material is ground away to sharpen them, which is another saving. Since a set of knives now runs a full shift, there is no lost time for the crew for knife changes.

The chips produced are much more sharply cut. This means better acid penetration into the chip in the digester. The amount of oversized chips going to the rechipper has been materially reduced.

The Scale Recorder unit was purchased from Northern Lakes Forest Products of Park Falls, Wis., and the cost was $300.00, including installation. It operates with a ¼ hp motor. The unit can be installed in a 3-by 3-by 3-ft space as part of a sawdust chute. Results to date show that wood savings, knife savings and time savings are more than returning the cost of the weigher once each week on a 250-cord-per-day operation.

It is possible that many mills were doing a better job of grinding knives than Flambeau was, although Flambeau has a new knife grinder and thought their grinding was up to standard. The sawdust weigher reports the condition of knives continuously. A set of knives that have brushed a grinding stone too hard are pin pointed in two or three hours of operation. Properly ground knives hold a constant rate of sawdust during an 8-hr., 125-cord operation. Should the knives cut into tramp iron, wire, etc., the sawdust recorder shows there is trouble.

It has been found that each specie of wood has a sawdust rate. Also, it has been found that when the temperature of the wood drops to 0° F. and below, the sawdust rate goes up from 5 to 15 lb. per cord of wood. Undoubtably there is a sawdust rate for various chip lengths but this point has not been studied.

The Scale Recorder unit was pictured and described on p. 824 in the February issue of The PAPER INDUSTRY.

Recent Expansions in the Industry

Sisalkraft Enters Polyethylene Extrusion-Lamination Field

The American Sisalkraft Corp. of Attleboro, Mass., has announced plans to enter the polyethylene extrusion-lamination field.

Expansion work has been started to prepare facilities for the installation of one of of the largest polyethylene extruder laminators available today. The equipment will produce plastic-laminated products of polyethylene-paper; polyethylene-aluminum foil; polyethylene-polyethylene, and similar combinations up to 96 in. in width. Full production is expected by next spring.

Menasha Plans Mill in Oregon

Menasha Wooden Ware Corp. of Menasha, Wis., has announced plans to construct a semichemical pulp and paper mill in North Bend, Ore.

The new mill will be a further step in the integration of the firm's west coast operations. Construction will begin shortly and completion is expected in middle 1961.

Work Starts on Denver Plant for Boise Cascade

Boise Cascade Corp. has broken ground for a $2.5 million plant for the manufacture of corrugated shipping containers in Colorado.

The actual plant site is located between Denver and Golden. Paper for the operations will come from Wallula. Principal machinery in the new plant will be a huge corrugating machine.

Hardinge to Expand Foundry Facilities

Hardinge Mfg. Co., a Hardinge subsidiary, will spend $300,000 to expand and modernize its foundry facilities. The latest in core ovens, sand mixing apparatus, cranes and other materials-handling equipment will be installed.

The Hardinge foundry at present has two cupolas and is capable of pouring single castings up to 30,000 lbs. It is one of the few foundries in the area which specialize in "pit-molding", and the only "Meehanite" licensed foundry in central Pennsylvania. It also pours "Ni-Hard" wear-resistant castings.

Longview Orders Ninth Machine

Longview Fibre Co. of Longview, Wash. has placed an order for the firm's ninth paper machine with Beloit Iron Works. The new machine, which will trim 163 to 168 in., will produce about 125 to 150 tons of paper or corrugating medium per day. This will increase the total mill production to about 1250 tons of pulp and paper products daily.

According to preliminary estimates, the machine is expected to cost approximately $5 million and is also expected to go into operation in the spring of 1961.

Banner Fibreboard Completes Improvement Program

A plant improvement program which adds an estimated 15 per cent to the capacity for producing colored linerboard and other specialty paperboard has been completed by Banner Fibreboard at Wellsburg, W. Va.

An open top stock preparation chest with an agiflow pump, a Jordan and a pH recording system are among the principal equipment installed during the program.

D. E. Lewis, vice president and general manager, stated that the improvements will result in improved color uniformity and opacity, while permitting greater versatility in changing production from one color to another.

Recovery Units Installed At New York & Penn

New York & Pennsylvania Co. is continuing its modernization program with the installation of two Colloidair Flotation save-alls at its Castenea mill located in Lock Haven, Pa. These units are in addition to four similar units already in operation at the Johnsonburg, Pa., mill and six others operating at its Lock Haven mill.

The installation of these units have proven effective in the prompt recovery and re-use of fiber to preserve the homogeneity of furnish for a specific grade of paper.

Modernization Program Planned for Knowlton

A plant modernization and expansion program has been planned for Knowlton Brothers of Watertown, N. Y. The new facilities will help to increase the quality and amount of the special paper products produced by the company.

Major items included in the program are: (1) Construction of a $100,000 addition to the filtration plant to remove radioactive contaminants from plant process water (Further information on this project was discussed on page 793 in our February issue); (2) Construction of a 90- by 50-ft. warehouse for the storage of in process paper products; (3) A 50 per cent increase in the quality control department's facilities; (4) A new conveyor system to facilitate the delivery of finished paper products to the outbound shipping department; (5) An automatic control system that measures the amount of ingredients that go into a batch of in-process paper pulp; and (6) A water saving program which was started a year ago.

Electric Eye Starts Second Expansion Program

Electric Eye Equipment Co. has announced that construction has started at Danville, Ill., to expand the company's facilities. This is the second expansion program for the company since the present plant was completed in 1954. In 1958 the manufacturing area was expanded.

The expansion program now in process, will increase the office area approximately two-thirds over its present size and the manufacturing area will increase by about 8,000 sq. ft.

The company has also exercised an option to purchase joining property where there will be ample area available for future expansion.

St. Regis at Tacoma

St. Regis Paper Co. announces that it has commenced production at its new sheet plant at Tacoma, Wash. The sheet is used in the manufacture of corrugated containers. The plant has 70,000 sq. ft. of floor space.

Black-Clawson Forms New Department

Black-Clawson has recently formed an Air Systems Department which is located at its Fulton, N.Y., address.

The department is fully staffed to specialize in engineering and marketing air drying equipment and systems for the pulp, paper and converting industries.

Production Begins on New Machine at Owens-Illinois

A new 170-in. paper machine has begun production at the Big Island, Va., plant of Owens-Illinois.

The fourdrinier-type machine, which replaces two 102-in. machines, is housed in a new 66,000-sq. ft., two-

story addition to the mill. It will give an immediate daily capacity of 265 tons and a future potential capacity of 380 tons.

Operating at speeds of 1,500 fpm, the Beloit Iron Works machine will produce the same type of paper the mill has been making.

Screw Conveyor Expands at Winona

A new addition is presently under construction at the southern plant of Screw Conveyor Corp., Winona, Miss.

The construction consists of a group of buildings which will house enlarged structural and fabricating departments — permitting greater flexibility in the manufacture of Kewanee Hydraulic truck dumpers and will also increase the production of screw conveyors troughing, elevator buckets, bucket elevators, screw-lifts and other fabricated products.

Nicolet Installs Glassine Supercalender

A large glassine supercalender will be placed in operation at Nicolet Paper Corp. at West DePere, Wis.

Designed and built by Appleton Machine Co., the 147-in. wide, 16-roll "stack" is the third to be installed since 1955, each being larger than its predecessor.

The unit is powered by a 600-hp, Westinghouse dc drive and is designed for a maximum operating speed of 1500 fpm.

Consolidated Gets New Boiler Plant

The Appleton, Wis., mill of Consolidated Water Power & Paper Co. is stepping up its capacity for burning spent sulfite liquor by 47 per cent with the start-up of a new boiler plant.

Construction of a million dollar project began last spring. One of two boilers went into operation late in December. A new steel and metal building houses the new boiler which replaces six smaller capacity units.

Ownership changes

Abitibi Power & Paper Co. Ltd. of Toronto, Ont. has announced the purchase of the entire capital stock of *Pembroke Shook Mills Ltd.* of Pembroke, Ont., from *Canadian Canners Ltd.* of Hamilton, Ont. Pembroke operates a modern corrugated box plant and a large wood shook plant.

In error, our February issue stated: "A new corporation under the name of *Fiori Paperboard Inc.* has taken over the business and assets of the *Queen City Paper Co.* of Cincinnati". This paragraph should have read as follows: "A new corporation under the name of *Fiori Paperboard Inc.* has taken over the business and assets of one of the mills formerly owned by *Queen City Paper Co.* The mill is located at Tipp City, Ohio.

The Young Machinery Co. Inc. of Pennsdale, Penn., has acquired the entire plant and manufacturing facilities of the *Robinson Mfg. Co.* of Muncy, Penn. Robinson has been manufacturing a similar but additional line of equipment which Young manufactures — materials handling, pneumatic conveying and mixing systems.

Riegel Paper Corp. has acquired the net assets of *Bartelt Engineering Co.* Bartelt is a manufacturer of specialty packaging machinery. Riegel, in announcing the acquisition, stated that its entry into the packaging equipment field, was important because it would facilitate the research and development

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Let us engineer a "Kewanee" Hydraulic Truck Dumper into your layout. We build "Kewanee's" in 25, 45, 50 and 60 foot platform sizes, pit or grade-level and scale and non-scale types to accommodate any size truck or trailer. Photo above shows a 50 foot Kewanee with patented "A" frame, installed in a large pulp mill in Florida. You name the date for one of our representatives to call.

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News of the Industry . . .

of new and advanced ideas in packaging.

St. Regis Paper Co. announces that *Sherman Paper Products Co.* of Newton, Mass., has become affiliated with it through an exchange of stock. Sherman will be operated as a division of St. Regis with the same management and management policies.

American Envelope Co., who recently purchased the *Brown-Superior Paper Goods Co.*, has felt that the acquisition will strengthen their position with both personnel and machinery to better serve customer requirements. Both companies have been in the envelope manufacturing business in Chicago for many years.

Longview Fibre Co. of Longview, Wash., has announced the merger with *Downing Box Co.* Downing will continue as a Wisconsin corporation under the direction of George B. Downing, president, and his associates.

(Continued on page 878)

Coming Events

TAPPI

May 23-25—11th Annual Coating Conference Edgewater Beach Hotel, Chicago, Ill.

June 14-16—Pulp Bleaching Conference, Edgewater Beach Hotel, Chicago, Ill.

PIMA

April 23—Michigan Division, Hotel Harris, Kalamazoo, Mich.

April 29—New York-Canadian Division, Sheraton-Syracuse Inn, East Syracuse, N. Y.

May 13-14—Pennsylvania-New Jersey-Delaware Division (Spring Meeting), Hotel Du Pont, Wilmington, Del.

June 7-9—National Meeting, St. Francis Hotel, San Francisco, Calif.

OTHER MEETINGS

March 22-23—Folding Paper Box Association of America, Annual Meeting, Ambasador Hotel, Los Angeles.

March 27-30—National Paper Trade Association, Paper Show and Annual Convention, Waldorf-Astoria.

March 28-April 8—16th Annual Fiber Microscopy Course, Institute of Paper Chemistry, Appleton, Wis.

March 29-31—22nd Annual American Power Conference, Sherman Hotel, Chicago, Ill.

March 30—Paper Club of New York, Annual Dinner, Grand Ballroom, Waldorf-Astoria, N.Y.

April 4-7—AMA's 29th National Packaging Exposition and Conference, Convention Hall, Atlantic City.

April 6-7—Ninth Annual Forestry Symposium, Louisiana State University.

April 19—SAPI Eastern Luncheon meeting.

April 20-27—Interpack in conjunction with the 4th European Packaging Federation Congress, Dusseldorf (Germany/Allemagne).

April 21-22—Sixth Annual Conference on Electrical Engineering in the Pulp & Paper Industry, University of Florida, Gainesville, Fla.

April 29-May 8—Sixth International Exhibition of the Paper, Printing and Graphic Arts Industries, Exhibition Palace, Paris, France.

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Packaging Corp.'s New Corrugated Box Plant

The new, $2.5 million corrugated shipping container plant built by Packaging Corp. of America is now in full operation.

The 82,000-sq.-ft. plant is situated on a 23-acre site in Lancaster, Pa. This location is close to numerous major highway connections and will serve container needs in a seven-state area which includes most of Pennsylvania, Maryland, New Jersey, Delaware, West Virginia and parts of Virginia and New York.

Plant production capacity of 250 million sq. ft. of corrugated board per year will add an estimated $5 million to the company's overall annual sales which are now at the $125 million level. The new operation will employ 125 persons at full capacity.

Production

Equipment includes the latest automatic and semi-automatic machinery to produce corrugated board in a variety of thicknesses and weights, and to fabricate a wide variety of finished boxes in different sizes and designs. Finishes include: plaids, linens, wood grains and textures.

Layout of the plant was designed to provide a U-shaped production flow involving a minimum of materials handling. Paperboard rolls are brought to the corrugator, located 20 ft. from the storage area, by specially designed roll lifting trucks.

The 78-in. corrugator can operate at speeds up to 500 fpm. It is equipped with A, B and C flute single facers. The unit produces sheets in all sizes up to 185 in. long and 78 in. wide, with line thicknesses ranging from .012 to .030 in.

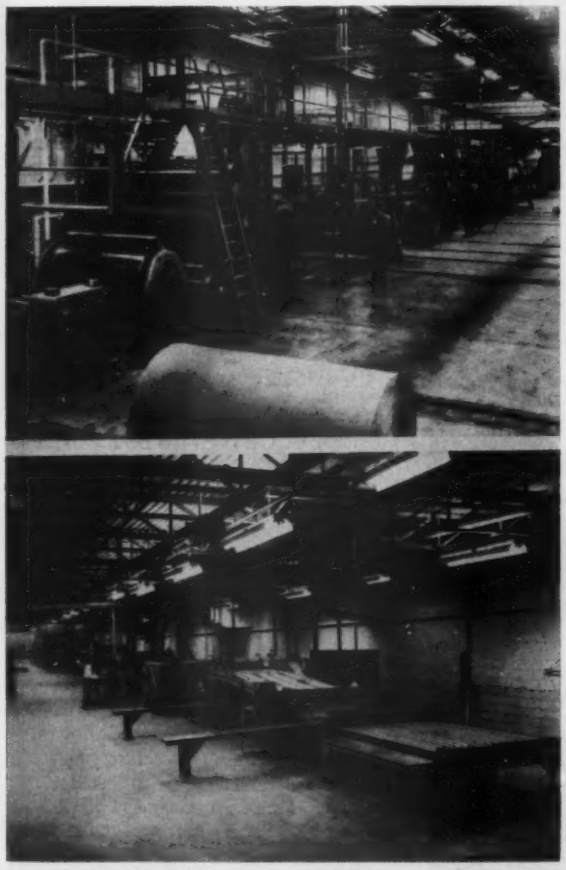
More than 2,000 gal. of starch adhesive will be manufactured daily in the plant to use in the making of corrugated board from paper board.

For two-color printing, the plant has a 140-in. and a 106-in. printer-slotter cylinder press, each capable of running 12,000 boxes an hour.

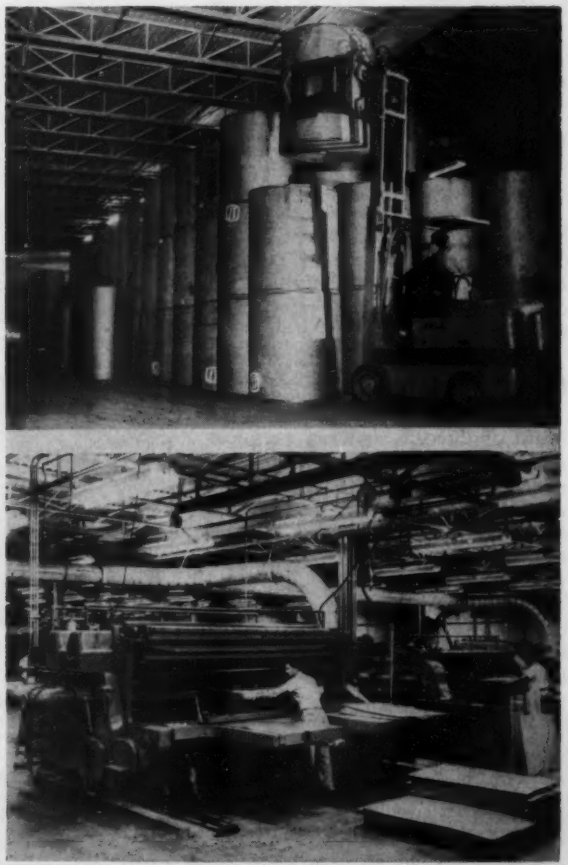
Other specialized equipment in the plant includes a 120-in. creaser-slitter, two die-cutters and a partition boxmaker and slotter. There are also machines to effect any type of closure—a folder-gluer, and semi-automatic stitcher and two semi-automatic taper machines.

Trim and waste from the corrugator, printer slotters and other units are recovered at five stations by a specially designed vacuum blower system, and carried to the baler for shipment to one of the company's mills, and reconversion to paper. An automatic exhaust system changes the air in the plant five times every hour.

Packaging Corp. of America was formed July 31, 1959 by the three-way merger of Ohio Boxboard Co., Rittman, Ohio; American Box Board Co., Grand Rapids, Mich.; and Central Fibre Products Co. of Quincy, Ill. Each of these companies is now a major division. Their combined facilities include 22 corrugated container plants and 11 folding carton plants in addition to extensive research laboratories and timberlands and tree farms.



Two views of the 300-ft. corrugator which runs at speeds up to 500 fpm. It is operated by a six-man crew. Top photo shows loading point and bottom photo shows delivery point.



Storage room, with capacity for 2,000 tons of paperboard stock, is shown in top photo. Bottom photo shows one of two high-speed presses capable of printing two-color messages on boxes.

NAMES *in the* NEWS

TAPPI

M. A. Burnston is now serving as a member of the permanent headquarters staff of TAPPI. He is serving in the capacity of technical assistant.

In this new position, Burnston will work with TAPPI's technical associates in the development, execution and guidance of TAPPI divisional and committee activities.

M. A. Burnston

P. G. Mansuy

Huyck Felt Co.

Paul G. Mansuy has been appointed sales manager in charge of the nationwide sales force of the Huyck Felt Co., a division of Huyck Corp.

Mansuy succeeds Arthur S. Hayeslip, who recently became vice president in charge of sales. He joined Huyck in 1952 and held the position of assistant sales manager prior to his new assignment.

Michigan Carton Co.

Dan Int-Hout Sr., a member of the board of directors and vice president of Michigan Carton Co. has announced his retirement from active duty with the company. Int-Hout has served the Battle Creek firm as manager of its Chicago sales office for 30 years.

At the same time, Robert G. Pender was named as a member of the board and was elected vice president, board sales. Louis J. Philipps, chief plant engineer, was elected to the office of vice president, engineering.

Packaging Corp. of America

J. C. Morris of Wadsworth, Ohio, was recently appointed to senior vice president of the board; Robert G. Paramore, of Quincy, Ill., will be senior vice president of the container operations; Kenneth R. Mull of Grand Rapids, Mich., to senior vice president of container sales; G. V. Bayle of Akron, Ohio, to senior vice president of cartons; and W. Harvey Mapes Jr. of Munster, Ind., to vice president of molded products.

All five officers are drawn from the management of the three old-line concerns which merged on July 31, 1959 to form Packaging Corp. of America.

J. C. Morris

R. G. Paramore

K. R. Mull

G. V. Bayle

H. H. Mapes Jr.

F. B. Younger

Appleton Woolen Mills

Frank B. Younger, north central states sales representative for Appleton Woolen Mills, Appleton, Wis., has also been assigned supervision of the Southwest territory—a four-state area ranging from Mobile, Ala., in the East through Texas in the West.

Younger replaces W. W. Jackson, who has resigned from Appleton. Jackson, a former paper mill superintendent, plans to return to the paper industry.

Beloit Iron Works

Rudi L. Kutter has been positioned as Beloit's export Sales manager. This new appointment will bring even closer cooperation between Beloit, its affiliates and licensees throughout the world as well as increased service benefits to Beloit customers.

General Aniline & Film Corp.

The following appointments and changes affecting Antara Chemicals' field sales force have been made.

Alfred W. Purdy has been promoted to Eastern regional manager.

John P. Miller will replace Purdy as a sales engineer for the Philadelphia area.

Joseph A. Czerwinski has moved into Miller's previous position as sales engineer in the St. Louis area.

William C. Brunson is being transferred from Atlanta, Ga., to the company's New Jersey territory.

Replacing Brunson in Atlanta will be Eugene M. Kennedy.

Mead Corp.

Organizational changes which were recently made at the Mead Research Center in Chillicothe, Ohio, has resulted in the promotion of the following three men.

John C. Redd has been named director of research and development; Henry G. Caldwell has been appointed director of corporate technical service; and Charles H. Schneider is the new research administrator.

Clinton Corn Processing Co.

The following sales personnel have announced their retirement.

E. H. Knoernschild, assistant sales manager for lactic acid and crude sugar, retired after 26 years of service. His responsibilities will be assumed by R. H. Boegel, formerly sales manager in the middle Atlantic states.

L. H. Smith, district manager at Kansas City, retired and will be succeeded by Robert Ingold.

The responsibilities of Frank Root, special paper mill representative in Ohio and Michigan, have been transferred to Clinton's Cincinnati district

office since his retirement, and will be under the direction of J. C. Alderson, district manager.

Samuel Clayman, district manager for the central Pennsylvania and Maryland area, will be succeeded by John Weir, resident representative at Baltimore.

R. E. Mikkelsen, who requested early retirement because of ill health, will be succeeded by D. R. Reed, formerly district Manager at Milwaukee.

The company has also made the announcement on the promotion of Harold A. Bendixen to the position of senior vice president. Formerly vice president and general sales manager, Bendixen will assist Roscoe C. Wagner, president of Clinton, in the overall management of the company in his new capacity.

Alfred C. Junge will succeed Bendixen in the sales functions of Clinton.

American Sisalkraft Corp.

Charles E. Judge, vice president of procurement and also a director, has retired after 37 years of service with the firm. He began his career with Sisalkraft in 1923 as superintendent of the original mill (American Reenforced Paper Co.) and in 1946 he was elected to his present position.

Nalco Chemical Co.

Fred Campbell Jr., formerly area manager at Indianapolis for Nalco, has been named manager of the company's southern Ohio district, with headquarters at Dayton, Ohio. Campbell succeeds G. D. Sievertsen, who has been transferred to managership of the company's northeastern district, with headquarters in Boston.

Pulp & Paper Research Centre Inc.

John Lewis, former head of the paper engineering department at Lowell Technological Institute, has been appointed technical director of the Pulp & Paper Research Centre Inc., located at Lawrence, Mass.

Reichold Chemicals Inc.

The company has decentralized its emulsion coatings technical service to permit improved service to customers throughout the country. Under this new arrangement, there are regional technical service representatives at five cities. These representatives are located as follows:

At Elizabeth, N. J.—John Weinmann, Israel Feld and John Bress. In Detroit, Mich.—Thomas Mitchell and Drew Baker. Tuscaloosa, Ala.—John Sims and Paul Bloomquist. Argo, Ill.—Arthur T. Gronet. Azusa, Calif.—Rene Durr.

Paper Converting Machine Co.

Frank Volm has been appointed as sales engineer. Volm comes to the company from the Marathon Division of American Can Co., where he held the position of plant engineer at Marathon's plant in Menasha, Wis.

Fraser Companies Ltd.

Marcel Barsalou has been appointed as manager of the pulp and paperboard mills. He will succeed C. T. Clark who was recently named vice president of manufacturing by the board of directors.

Also in Edmundston, N. B., came the announcement of the election of K. W. Matheson as vice president of the company. He will succeed L. M. Sherwood who has retired.

John H. Feck has accepted his new position as superintendent of the groundwood specialty paper mill in Madawaska, Maine. He will succeed John X. Coppens who has retired on pension.

(Continued on page 906)

Attractive, Corrosion-Resistant Glazed-Tile Effluent and Water Treatment Tanks

As the final step of construction, Stebbins workmen carefully wash down the exterior of the tanks with acid.

In this view of tank floors under construction, note the clean, smooth joints – the mark of good workmanship. Note the variety of tile shapes. Horizontal and vertical steel reinforcing is shown in the walls which will be solidly filled with concrete as work progresses.

Complete Service— Design, Installation, Maintenance

WRITE FOR BULLETIN AET-59

SEMCO

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Washed Stock Screening
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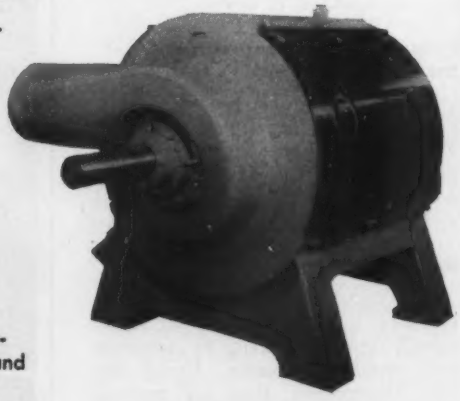
Sealed Black Liquor Knotting
Fibre Length Classification
Paper Stock Cleaning

The new Impco Centrifugal Pulp Screen is the latest example of the progress made toward the ultimate in low cost quality screening. This screen incorporates many improved principles and features such as:

- — a stock inlet allowing direct top, bottom, front or rear infeeding which simplifies installation piping;
- — a tangential inlet which changes flow direction from linear to rotating, yet retains velocity head;
- — a special stator which provides uniform internal distribution of pulp;
- — a patented high-efficiency rotor which increases capacity without additional horsepower;*
- — a bottom accepted stock outlet permitting all sub-floor piping;
- — a full length quick-opening door for routine accepted stock sampling;
- — an accessible rejects outlet for tailings inspection or sampling.



These features are resulting in peak capacities and high discharge consistencies at lowest horsepowers. Reject richness is readily controlled. Engineered simplicity is characteristic of the entire line of Impco Centrifugal Screens which require very little operating attention and mechanical maintenance.

* U. S. Patent No. 2,845,848.

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FOREIGN ABSTRACTS

Hydrotropic pulping experiments in Japan

Using red pine and a Japanese oak, the author prepared hydrotropic and NSSC pulps using varying conditions. Both the technological and economic aspects were considered. Inasmuch as 4 different hydrotropic reagents gave equivalent results, the cheapest, sodium xylenesulfonate, was used; the pulping effects of this salt dropped greatly when the concentrations were 25 per cent or less, and a 35 per cent concentration was found to give the best results. When a 45 per cent solution was used, a portion of the reagent precipitated at room temperature.

Small chips (3 by 3 by 1 mm) proved more suitable in the digestions than did wood meal. Pinewood could not be digested satisfactorily with sodium xylenesulfonate under any conditions, because with increased cooking time, the carbohydrates decreased and the lignin content increased. Oakwood could be pulped satisfactorily by the hydrotropic digestion, but the products always retained at least 5 to 10 per cent lignin. When attempts were made to decrease this lignin content, there was a drop in the holocellulose remaining in the pulp. Pulp yields were about the same at 150 and 180°C; *i.e.* 55 per cent (for lignin contents of 10 per cent), as compared with yields of about 71 per cent for NSSC pulp having the same lignin content.

Thus it is evident that in hydrotropic pulping, considerable amounts of the hemicelluloses dissolve, and the spent hydrotropic liquor cannot be rejuvenated and re-used for pulping after applying conventional methods of filtration, concentration, etc. A two-stage (prehydrolysis-hydrotropic) pulping method does not appear economically feasible.

16 references. Mamoru Kusumoto. *J. Japan. Tech. Assoc. Pulp Paper Ind.* 13, No. 8, 578 to 585 (1959) (through *Abstr. Bull. Inst. Paper Chem.* 30, 481 to 482) (original in Japanese with English summary.)

Isolation of lignin from sulfite spent liquor

The liquor was treated with 2 per cent (by volume) of ammonium hydroxide, and heated 2 to 4 hours at 150 to 170°C. This involved reactions comparable to those obtained with sodium hydroxide, and gave rise to an alkali sulfite lignin (A.S. lignin) resulting from the removal of sulfur dioxide (originally bound to carbonyl groups), the partial liberation of phenolic hydroxyl (formed by fission of ether linkages), and a partial degradation of sulfonic acid groups. There is also a general reduction in the amount of hydrophylic groups; this appears to account for the insolubility of the final A.S. lignin in acids.

The ammonia process gives rise to 60 to 75 per cent A.S. lignin, based on the dry solids content of the spent liquor; this is useful in removing lignin from the other spent liquor components. A.S. lignin can be condensed with phenol, formaldehyde and with hexamethylenetetramine. Because of the "hardening properties" of wet A.S. lignin, the latter can be used as a partial replacement of carbon black in rubber manufacture.

A.S. lignin and its chlorinated products can be used as tanning agents, in drilling muds, as ultra-violet absorbents and in the treatment of boiler feed water. Insecticidal properties were noted in the case of chlorinated-mercury derivatives of the A.S. lignin.

Twenty references. Rudolf Borísek. *Sbornik Vyzkumnych Prací z Oboru Cellulosy a Papíru* 2, 184 to 200 (1957) (original in Slovakian with Russian, English and German summaries) through *Abstr. Bull. Inst. Paper Chem.* 30 358 (1959).

Distribution and retention of fillers by paper sheets

Both laboratory and mill experiments are described, but the author points out that, at present, no valid generalizations are possible until the tests are extended. Results of retention and opacity tests are shown in Figure 1. Here, the stock used was a sulfite pulp to which 5 per cent of the appropriate filler had been added, with beating to 55°S-R, and sizing with 2 per cent rosin and 3 per cent alum; the final pH was 6.3. ("Ohne Füllstoffe" refers to the control carrying no "loading materials"; Kreide = chalk). Under the above conditions, the highest retention was obtained with kaolin, and the maximum opacity with titanium oxide (Kronos A).

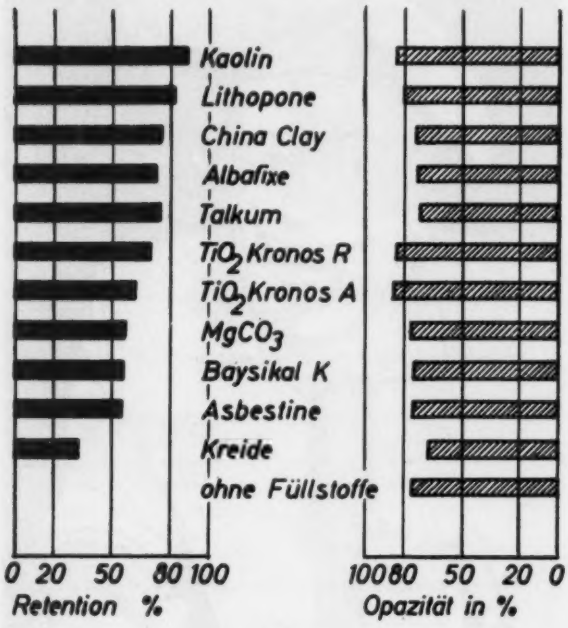

Fig. 1

In general, the present data confirmed the findings of other investigators. The upper side of the sheet retained far more of the filler than did the wire-side; this is due to a "process of classification" taking place during sheet formation on the paper machine, and beginning as early as the breast box. Apparently the suction boxes do not initiate the differences in composition on the two sides of the paper web, although their action may serve to increase such differences. An assumption is that the dandy roll may also increase the filler retention on the upper side. Actually, the degree of retention is contingent on the fiber species and their properties, and, as indicated in Figure 1, on the type of filler used. An improvement in retention was obtained by adding both sodium aluminate and alum to the stock suspension. Figure 2 shows a phase contrast photomicrograph of fibers treated with

Fig. 2

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We can assure you fast action and satisfaction.

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sodium aluminate and coated with particles of the filler.

Twenty-one references are given, as well as 16 figures. Heinz Mack. *Das Papier* 13, 459 to 469 (1959) (in German, with English summary).

Sulfite spent liquors and water pollution

After giving a review of spent sulfite liquor composition and of the amounts of the spent liquors in the sulfite pulping industry, the author discusses the influence of the different components of the liquor on stream pollution in Finland. This is illustrated by means of the Biochemical Oxygen Demand, the values of which can be used in calculating the total effluent load of a sulfite pulp mill. Mathematical means are also used in calculating the maximum tolerable effluent drainage under a variety of conditions. What has been termed the "oxygen balance" of streams has also been computed.

Furthermore, a description is given of a 10-point survey of available means of preventing stream pollution caused by effluents from the sulfite pulp industry. Emphasis is placed on the biological methods of treatment, as well as on the evaporation and combustion of the spent liquor. From the survey on stream pollution, evidence is furnished that the Finnish industry does not pollute water to an extent that might be assumed from the quality and quantity of the waste waters. In Finland, the author believes that the problem of stream pollution is approaching a positive solution.

Sixteen references. Harald Tötterman. *Finska Kemistsamfundets Med.* 67, No. 3, 85 to 100 (1958) (in Swedish, with brief English summary).

Japanese studies in pulp and papermaking

These are two of a long series of articles, many of them published previously. The first one deals with studies on chemigroundwood, with special reference to pulps from hardwoods.

Test blocks of wood were prepared from 9 hardwoods and 4 softwoods, conditioned to 16.2-per cent moisture, placed in an evacuated digester and cooked either with one-per cent neutral sulfite liquor (4 hours, at 110°C., maximum pressure 5.3 kg./sq. cm.) or with five-per cent neutral sulfite solution and cooked 3 hours at 140 deg C. (using maximum pressures of 2.6, 5.6, 8.5, or 12.3 kg./sq. cm.) Samples of these treated blocks were then ground both with a sharply burred and with a dull artificial pulpstone. The latter reduced the rate of production but gave a (screened) pulp of improved quality. Usually the more severe chemical pretreatment increasd the rate of pulping, freeness, and the long-fibered fractions as well as the strength properties of the pulp.

As compared with any of the milder pretreatments, the energy consumption on grinding also decreased. Except for certain "stained" woods, most of the chemigroundwood pulps were as satisfactory or actually superior in brightness to that of commercial mechanical pulps. The brightness range was usually 58 to 63 per cent.

The second paper, by the same authors, describes fundamental experiments on air resistance of pulps. Four laboratory kraft pulps (from beech, birch, aspen, and pine) and one commercial sulfate pulp were extracted at room temperature, with 5-, 10- and 15-per cent sodium hydroxide solutions. The hemicelluloses that were alkali resistant (i.e.—those that remained in the pulp) amounted to 3 to 5 per cent in the hardwoods and 7 to 10 per cent in the case of pine. Alkaline extractions increased the amount of fibers passing a 150-mesh screen.

This reduction in fiber coarseness, caused by a decrease in swelling capacity, was least marked in the long-fibered pine pulp. Among the hardwoods it was most evident in beech, less in poplar and least in the birch pulps. The lowest air-resistance factor (0.3 secs./mm.) was shown by beech pulp that had been extracted with 15-per cent caustic soda as compared with 1.3 to 1.8 secs. mm. for other treated laboratory pulps, and 0.9 sec./mm. for alkali-treated commercial pulp. On the other hand, a highly porous and fairly hopogeneous sheet with an air-resistance factor of about 1.5 sec. mm., was obtained from the beech pulp on treatment with 7-per cent sodium hydroxide. Usually the alkaline treatment increased uniformity in the thickness of the hardwood pulp sheets, but did not have this effect on softwood pulps.

F. Teratani and Y. Kimura. *Wood Research* (Kyoto) No. 20, 37 to 54 (Sept. 1958) and No. 21, 1 to 11 (March 1959) through *Abstr. Bull. Inst. Paper Chem.* 30, 332 and 336 (1959) (the originals are in Japanese, with English abstracts).

Regeneration of straw kraft black liquor

The liquor from the sulfate pulping of wheat straw was heated with the exclusion of air in a columnar combustion chamber at 430 to 1200° C. The chemical reactions and the changes in chemical composition that were taking place were monitored by periodic analyses. The reduction of any sulfates that were present was shown to occur in two stages, and via intermediate products. Below 480°, about 40 per cent of the sulfate was reduced by the interaction with organic matter, presumably forming sodium thiocarbonate. The remaining 60 per cent was reduced above 580°, also yielding the thiocarbonate by way of sodium sulfide and carbon oxysulfide. Subsequently, at about 700°, the total thiocarbonate is decomposed into sodium sulfide and carbon dioxide. Besides the reduction of the sodium sulfate, there is a slower but concomitant reduction of sodium carbonate above 700° C.

That there is an appreciable loss in sodium salts above 950°, was confirmed in studies made on a plant scale. By using a tower-shaped combustion furnace of the Tomlinson type, marked losses occurred due to atomization. In order to insure a favorable black liquor combustion, the temperature of the mass at the base of the tower should be held quite consistently at about 900° C., and only as much air should be admitted to the liquor surface as that required to insure complete combustion. The glowing porous carbon-containing mass should be kept at a temperature at which the reduction of the liquid smelt, trickling through it, reaches the optimum. Despite the low calorific value of the original straw liquor, no additional fuel is required for the furnace operation. However, in order to prevent scaling, liquors that are rich in siliceous components should be freed from these as thoroughly as possible before the combustion is undertaken.

37 references. Richard Kolb. *Dr. Eng. thesis,* at the Rheinisch-Westfälische Tech. Hochschule, Aachen Ger. 71 pp. (1957) (original in German); through *Abstract Bull. Inst. Paper Chem.* 30, 661 & 662 (1960).

Measurement of the flow of stock suspensions

The authors give a full description (with illustrations) of an apparatus used in measuring such flows electrically. This is the "Altoflux", the use of which indicated that there was a strictly linear relationship between the indicator readings of the instrument and the flow rate (given in liters per minute), of pure water, dilute acids, rag stock suspensions, mechanical pulp or waste paper suspensions, and stocks containing fillers. Other examples are also given. Any changes in temperature were also correlated linearly with the flow rates.

Walter Brecht and K. Wimmer. *Wochbl. Papierfabrik* 87, 895 to 900 (L959) (in German).

Semichemical pulps; their conversion into rayon pulps.

Three kinds of semichemical pulps were produced from spruce, beech and poplar: (a) by digestion in aqueous alcohol in the presence of sodium sulfite and acid; (b) by the NSSC process; (c) by a modification of the so-called "non-base" sulfite process. Various bleaching and refining methods were used in the conversion of these pulps. Included were chlorination, hypochlorite and chlorite bleaching, alkaline extractions, as well as an acid treatment. In large measure, these after-treatments determine pulp properties, and the operations seem to insure greater flexibility in dissolving pulp production. This was especially true in reduction of the polymolecularity and viscosity of the pulps obtained. The yields were usually quite satisfactory, but further improvements in reactivity and in processibility are required.

V. Jacopian and P. Schorning. *Zellstoff u. Papier* 8, 332 to 340 (1959); through *Abstr. Bull. Inst. Paper Chem.* 30, 630 (1960). (original in German, with English and Russian summaries).

Bacterial decomposition of "dredge pulp"

Dredge pulp (the cellulose-containing sediments) obtained from the fiord of Ornsköldsvik, was tested bacteriologically, and it was shown that anaerobic decomposition is very slow at the low temperatures that prevail at the bottom of the fiord. Under usual circumstances, the dredge pulp seems to have no practical influence on the biochemical oxygen demand of the water.

Lennart Enebo. *Svensk Papperstidn.* 62, 747 to 748 (1959) (in Swedish, with brief English summary).

NEW INSTANT MOISTURE CHECK ON MOVING ROLLS

On moving paper rolls, on production lines, with roller type, plug-in electrode.

D-1
Plug-in Electrode
Deep Penetration (3")

S-1
Plug-in Electrode
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Other plug-in electrodes for flats, skids, rolls. Deep or shallow penetration.

Instant, accurate registration of moisture content and patterns on moving paper rolls is now possible. The PM Model is accurate in the 0%-40% range on paper, paper board and similar materials of known density. A nomograph eliminates calibration curves. Three different plug-in electrodes, automatic compensation for 90-130 volt line fluctuation, and zener diode protection add to usefulness.

Moisture Register's new portable PM Model has many features:

- Checks moving rolls.
- Multiple range settings.
- Nomograph eliminates calibration charts.
- Master Unit takes plug-in electrodes for many uses.
- Tests stacks, skids, hardboard.
- 6", 3", and ⅛" penetration with R-1, D-1, S-1 electrodes respectively.
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MELVIN NORD*

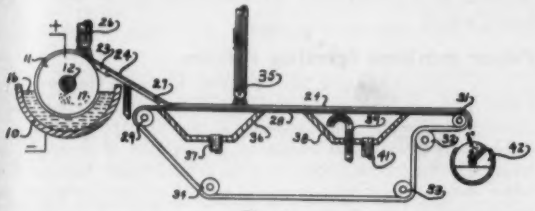

Fig. 1

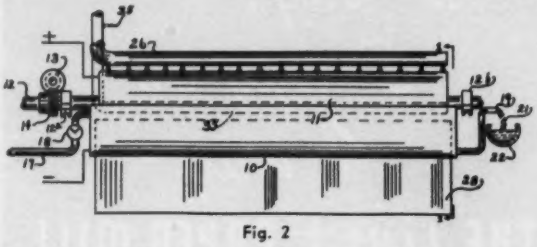

Fig. 2

Electrolytic treatment of black liquor

U. S. 2,905,604, issued Sept. 22, 1959, to Absalom M. Kennedy and John M. Jernigan, provides a process for the recovery of lignin from spent black liquor.

In Figs. 1 and 2 are shown an electrolytic cell 10 made of sheet steel which is connected to the negative pole of a current source, thereby functioning as the cathode. The anode of the cell, connected to the positive pole of a current source, is shown at 11 and is mounted for rotation on a shaft 12. The anode rotates in an electrolyte 16 of alkaline black liquor from which the oily or resinous matter, such as the soap skimmings from coniferous wood chips, has been removed.

The black liquor is supplied through a pipe 17 controlled by a valve 18, and enters preferably at the upper part of the cell. The resulting alkali enriched liquor produced at the cathode 10, flows to the opposite end and is discharged through a tube or pipe 19 connected to the lower part of the cell, but so arranged that the effluent 21 is at a higher elevation so as to maintain a constant level of the electrolyte 16 within the cell, as shown, A trough or conduit 22 is provided to convey this effluent to storage or to be used in the digestion of a fresh batch of wood chips.

When current is passed through the electrolyte, ligneous material is deposited on the anode 11 which rotates clockwise (see arrow in Fig. 1) and is removed therefrom by the scraper 23 in a thin layer as indicated at 24. A tube 26 is arranged for spraying a regulated amount of water on the ligneous film to dilute and soften it.

The film 24 is discharged from the scraper 23 onto a side 27 and then onto a moving belt 28 of porous fabric carried by pulleys, one of which, such as 29, acts as a drive to maintain the belt at a speed to provide a film of ligneous material of convenient thickness for the subsequent washing and other operations to produce a finished product.

The ligneous film 24, as deposited on the anode and discharged on the belt 28, contains some of the alkaline black liquor 16 by absorption. On leaving the scraper 23, the film receives a spray of water provided through a pipe 35, which passes through the film and the belt 28 into a tank 36 and is removed through a pipe 37.

To remove excess water from the ligneous film 24, it is moved by the belt 28 over a second tank 38 in which a sub-atmospheric pressure is maintained through a pipe 39 connected to a vacuum pump. Any water which accumulates within the tank 38, may be removed through a pipe 41.

After passing over the tank 38, the lignin, now partially dried and having but slight adhesion to the belt, is carried over the pulley 31 which is of comparatively small diameter, the flexing of the belt serving to strip the ligneous film therefrom and to discharge it into a conveyor 42, by which it is transported to a dryer, operated at an elevated temperature and in which most of the water is removed and the lignin is brought into a substantially dry state. The flakey dried material may then be pulverized to reduce it to a very fine or impalpable powder which is characteristic of lignin.

Wet strength paper

U. S. 2,913,356, issued Nov. 17, 1959, to Carl W. Schroeder and assigned to Shell Development Co., describes a method for preparing paper having improved wet strength, normal feel, excellent fold endurance, and good absorbency.

A polyether polyepoxide and an epoxy curing agent are applied to the pulp or to the paper. This provides high wet tensile strength and burst strength. This improvement is permanent and is not lost through hydrolysis, as is the case with the set strength obtained by the use of conventional resins. The treated paper is also non-toxic and useful for the preparation of food wrappers and containers.

Production of glossy wax-coated paper

U. S. 2,912,347, issued Nov. 10, 1959, to Milton Yezek and Walter C. Utschig and assigned to General Foods Corp., provides a process for producing glossy wax-coated paper.

As indicated in Fig. 3, a smooth, extremely glossy wax-coated paper can be produced at high rates of speed by applying a hot melt wax coating composition onto a web of paper and "shock-cooling" the coating composition while it is being cast on a portion of an endless coating member. This shock-cooling is achieved by first urging the coated paper web with the coating composition in a molten state into immovable relation with the endless casting member, the latter having a smooth mirror-finished surface which contacts the coating composition. Such urging is preferably effected by means of the pressure of an impression roll. The coating member is maintained on its smooth surface at temperatures below the point of crystallization of the wax coating composition.

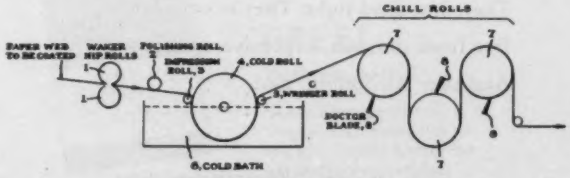

Fig. 3

The web of coated paper and the smooth surface of the casting member are immediately thereafter further cooled by water also maintained at temperatures substantially below the point of crystallization of the coating composition, the water being caused to contact the web of paper from the side thereof further removed from the smooth surface of the casting member and after contact by the wax coating composition with the smooth casting surface. By virtue of the shock-cooling of the coating which takes place, the web and the coating composition are maintained in immovable contact with the smooth surface of the casting member until a temperature sub-

*Patent attorney, 17600 Pinehurst, Detroit 21.

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stantially below the heat of fusion of the coating composition is reached and the coating composition is crystallized, whereby a slight bond is created between the coating and the contacting surface of the paper web, and the coating itself has developed sufficient tensile strength to overcome this bond without any adverse effects when the wax-coated paper is later peeled from the casting surface. The cooled wax-coated web of paper is eventually peeled from the casting member, preferably after the web leaves the zone of application of the cold water, the coated paper being preferably peeled under uniform tension from the casting member under the influence of a pressure roll maintained against the web of wax-coated paper.

Paper machine forming section

U. S. 2,911,039, issued Nov. 3, 1959, to Lloyd Hornbostel and Edgar J. Justus and assigned to Beloit Iron Works, provides an improvement in the paper forming section of paper machines.

The present invention results in the creation of a desired turbulence in the forming zone so as to achieve better formation and better integration of the two partial webs forming on the two converging wires.

As shown in Fig. 4, in the present invention two opposed cellular faced breast rolls 12 and 24 are mounted in nip-defining re-

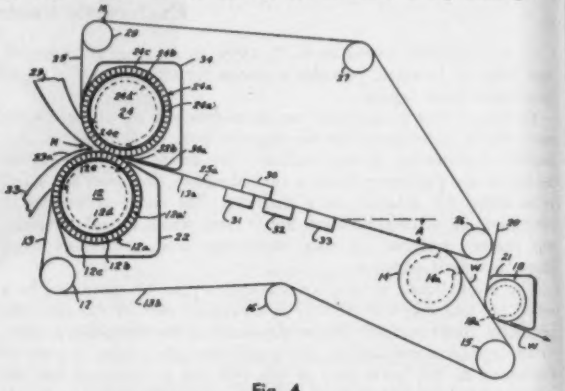


Fig. 4

lationship, the nip being substantially of the thickness of the web. The stock is forced into an enclosed forming zone at the oncoming side of the nip at such speed and under such pressure as to create turbulence at the nip and to drive the major part of the water in the stock through the cellular faces of the rolls and into the interior thereof. Vacuum is maintained in the interior of the rolls so as to assist in drawing the water thereinto. Separate stock feeds may be employed so as to feed two different kinds of stock into superimposed streams at the oncoming side of the nip. In each case the bulk of the water drained from the stock is drained past the cellular faces of the rolls, leaving only a relatively small amount of water (of the total water drained) in the cellular faces of the rolls. The nip and the off-running wire runs are aligned in a plane that is downwardly inclined from the horizontal and a save-all is mounted beneath the upper roll and between that roll and the wire trained over it so as to prevent the roll from throwing the water in the cellular face back down on the wire at the off-running side of the nip. The lower roll is also equipped with a save-all for the same purpose.

Brightening high density pulps

U. S. 2,912,297, issued Nov. 10, 1959, to Robert L. McEwen, Charles W. Raleigh and Carl E. Price and assigned to Food Machinery & Chemical Corp., describes a method of brightening high density cellulose pulp with a reducing bleaching salt at high speeds.

This invention is based on the discovery that commercially satisfactory bleaching effects are obtained if relatively minor amounts of a reducing agent (such as sodium hydrosulfite) are incorporated into the pulp at high pulp densities above 20 per cent, and excess water is removed immediately thereafter from the pulp.

Felt run arrangement

U. S. 2,909,848, issued Oct. 27, 1959, to Edward D. Beachler and assigned to Beloit Iron Works, describes an improved felt arrangement for paper machine dryer sections.

This invention is based on the discovery that the pumping ef-

fect of a traveling felt moving toward the dryer drum can be neutralized by an oppositely moving felt coming away from the dryer drums and which is positioned in close running relationship to the first felt and parallel to it. This arrangement eliminates any movement of air in the direction of the felt traveling toward the dryer section.

Increasing the mullen of paper

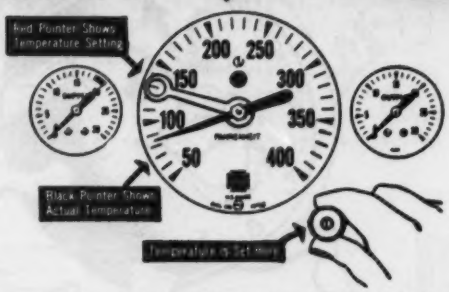
U. S. 2,913,364, issued Nov. 17, 1959, to Aaron Miller and Adolph L. Magnuson and assigned to Kelco Co., provides a method for increasing the mullen of paper without interfering with the drainage of the paper stock, thereby slowing down the papermaking process.

The papermaking fibers are treated with a combination of galacto-mannan gum, a water-soluble alginate, and a water-soluble poly-valent metallic salt. The latter causes the formation of an insoluble metallic alginate gel which absorbs together with the gum onto the papermaking fibers.

Other Patents of Interest to the Pulp and Paper Industry

Subject	Inventor or Assignee	Patent No.	Date
Flap folding apparatus	Raymond A. Labombarde	2,899,872	8/18/59
Folding and glueing apparatus	The International Paper Box Machine Co.	2,899,873	"
Apparatus for edge-glueing, cutting, and stacking carbon paper	Eldon L. Leibold	2,899,926	"
Device for screening pulp	The William Kennedy & Sons, Ltd.	2,900,077	"
Carrier carton	Crown Zellerbach Canada Ltd.	2,900,106	"
Egg carton	Florence A. Gross	2,900,119	"
Divider and divided tray	American Can Co.	2,900,120	"
Cellular carton	Continental Paper Co.	2,900,121	"
Carton	Donald Z. Steiner	2,900,122	"
Heavy duty paperboard container	Container Corp. of America	2,900,123	"
Carton with top handle	The New Haven Board & Carton Co.	2,900,124	"
Jordan	Charles Vidas	2,900,141	"
Cigarette container	Bernard J. Tamarin	2,901,097	8/25/59
Carton	Continental Paper Co.	2,901,155	"
Berry tray	Continental Paper Co.	2,901,156	"
Multicellular carriers	Federal Paper Board Co., Inc.	2,901,157	"
Box blank	Frank Carpino	2,901,158	"
Container construction	Clairborne E. Talbot, Jr.	2,901,159	"
Package structure	Joseph H. Vineberg	2,901,160	"
Container closure	Continental Can Co., Inc.	2,901,161	"
Spiral container tube	The Cleveland Container Co.	2,901,162	"
Winding machine for a paper web	The Black-Clawson Co.	2,901,191	"
Web winding mandrel	Paper Converting Machine Co., Inc.	2,901,192	"
Sizing composition	American Cyanamid Co.	2,901,371	"
Inorganic papers	General Aniline & Film Corp.	2,901,390	"
Wet strength paper	American Cyanamid Co.	2,901,391	"
Apparatus for defibrating hard wood	Jean E. Arguillere	2,902,090	9/1/59
Ice cream container construction	Gibson Patent Containers, Ltd.	2,902,198	"
Supporting pallet for cardboard box	Societe Anonyme de la Papeterie de Chateauneuf-la-Foret	2,902,199	"
Grape box	Paperbox Corp.	2,902,200	"
Heavy duty container for bulk material	Crown Zellerbach Corp.	2,902,202	"
Container	Sutherland Paper Co.	2,902,203	"
Container closure	George A. Moore	2,902,204	"
Treating wood pulp to decrease its molecular weight	Mo och Domsjo Aktiebolag	2,902,481	"
Wire draping device for fourdrinier machines	Dominion Engineering Works, Ltd.	2,903,060	9/8/59
High speed open-side fourdrinier machine	Dominion Engineering Works, Ltd.	2,903,061	"
Pulp molding dies	Central Fibre Products Co.	2,903,062	"
Pulp molding die	Diamond Gardner Corp.	2,903,063	"
Container end closure	King Container Corp.	2,903,173	"
Cartons	William P. Frankenstein	2,903,174	"
Folding box	Stanley Peimer	2,903,175	"
Paperboard shipping crate	Allied Plastics Co.	2,903,176	"
Carton	Diamond Gardner Corp.	2,903,177	"
Receptacle member	Aaron Berke	2,903,178	"
Collapsible carton construction	Bloomer Bros. Co.	2,903,180	"
Molded pulp wallet	Diamond Gardner Corp.	2,903,218	"
Bleaching of pulp	Pennsalt Chemicals Corp.	2,903,326	"
Paper size	Corn Products Co.	2,903,391	"
Paperboard armchair	Fleming & Sons, Inc.	2,904,105	9/15/59
Pan carton	Waldorf Paper Products Co.	2,904,170	"
Prewrapped box	Cambridge Paper Box Co.	2,904,238	"

New wet end dryer control improves finish . . . helps stop picking, curling, cockling on all types of paper



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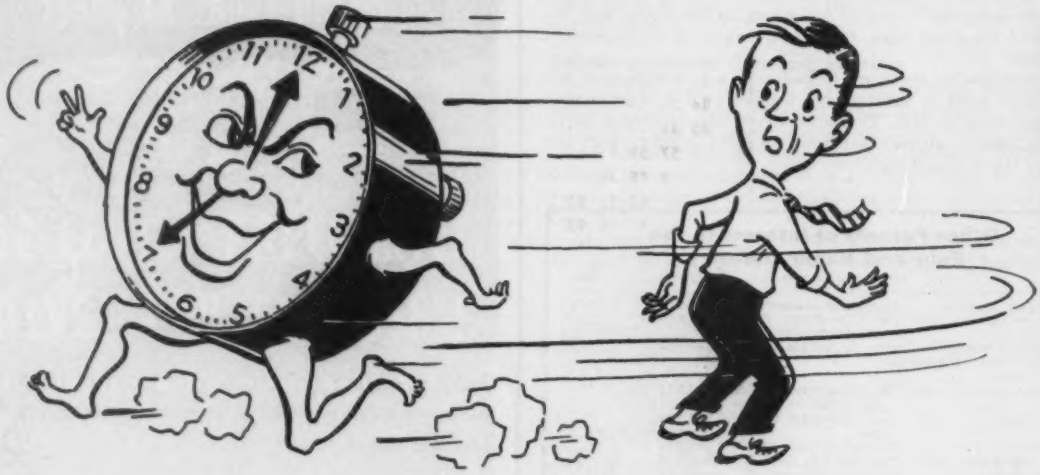

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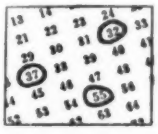

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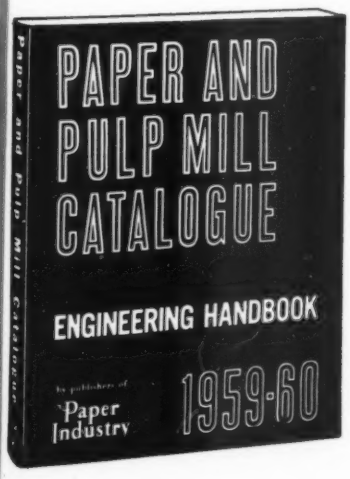

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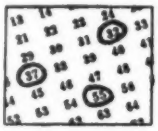

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DGDD-7401 Natural

A major economic breakthrough in the paper packaging industry is said to have been achieved by the development of a new high-density polyethylene extrusion coating compound.

Known as DGDD-7401 Natural, the material is reported to reduce coating weights (approximately one-half) required to give paper excellent impermeability to moisture, grease and oils. The company reports that the new compound can be extruded onto paper at good commercial speeds in coating weights as low as 6 lb./ream. Formerly, 20 lb./ream was the lowest practical coating weight possible with high-density polyethylene. *Union Carbide Plastics Co. Div., Union Carbide Corp.*

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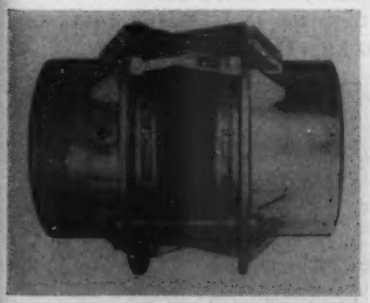
Valves with new plug coverings

Eccentric valves with Viton covered plugs are now available in sizes through six in. The resilient Viton facing, in combination with eccentric action, is said to provide a dead-tight shut off with highly corrosive liquids, gases and slurries. Since Viton is not damaged by slurry particles and does not cold flow, it is an ideal plug-facing material. *DeZurik Corp.*

Circle No. 2 on Readers' Service Card



Hinged expansion joints

Permitting a piping system to be entirely self-supporting, these hinged expansion joints eliminate the need for additional supports and reduce pipeline bending stresses. Movement is said to be more closely controlled than with any other type of expansion joint.

The standard model is designed to take rotation in one plane only. Therefore, these expansion joints are used in combinations of two or three. Slotted hinges are available for special application where axial movement must be permitted, but these units do not absorb axial pressure thrust. *Zallea Bros.*

Circle No. 3 on Readers' Service Card

Rolling Chopper

Called the Model SS-7 single-drum straight-blade rolling chopper, this new machine is said to be a fast, economical method of killing undesirable growth up to a dia. of six in. Smaller undergrowth is chopped completely; larger growth is eliminated by cuts and fractures through which sap drains off, thus killing the vegetation.

Of particular interest to pulp and paper firms, the new chopper may be used in reforestation projects to eradicate small hardwoods, to thin-out trees or prepare seed beds for future plantings.

With ten reversible cutting blades of abrasive-resistant alloy steel, the SS-7 cuts a 7-ft. swath and, when filled with water, weighs about 12,000 lb. Designed for use with tractors in the D6 or D4 class, the chopper easily attaches to standard drawbars. *Fleco Corp.*

Circle No. 4 on Readers' Service Card

Two reodorizers

Alamask RLT-637-F, a water dispersible reodorizer, is said to impart a neutral, clean and fresh odor to paper towels and tissues. Tests made on a wide variety of paper products, have indicated this product an efficient eliminator of wet paper odor.

Alamask TOM-X, another water dispersible reodorizer, has been developed specifically to control the musty odor in chip boards. It also reodorizes scents traceable to plasticizers, hydrocarbons, starches and adhesives. Its recommended application is 4 to 8 oz./ton of pulp, added at the calenders, *Rhodia Inc.*

Circle No. 5 on Readers' Service Card

New coupling line

A new low-cost Junior line of "Sure-Flex" couplings are available in the following three sizes: 3J, for stock bores from ⅜ through ¾ in.; 4J, from ½ to 1 in.; 5J, from ⅝ to 1-⅛ in. Peak hp ratings

FLIPPING the LINT OFF "FLIP-TOPS"

Jenkins' METLKOR Web Cleaning Brush of DuPont Tynex Nylon

The gravure production plant of the Downingtown Paper Box Company, Downingtown, Pennsylvania is an engineering triumph. Here, Marlboro "flip-tops" are produced on Champlain presses at speeds up to 2400 cartons per minute.

HERE'S WHAT THE DOWNINGTOWN PAPER BOX COMPANY SAYS: Mr. George J. Wolfer, Gravure Supt. says: "Jenkins' METLKOR brushes are contributing to the overall economy and quality that is so important to our production. When we reorder brushes, they will be Jenkins' METLKORS."

HERE'S WHAT THE MANUFACTURERS OF THE CHAMPLAIN INLINE GRAVURE EQUIPMENT, OF HARRISON AVENUE, ROSELAND, N.J., SAY: "The Jenkins' METLKOR brushes used in the web cleaning process of our Champlain inline gravure equipment are superior in performance and efficiency and are providing satisfactory and economical operation for our customers all over the world."

JENKINS' BRUSHES FOR PRINTERS

Dampener Roll Cleaning • Cylinder, hold down • Web Cleaning • Dusting • Removal of anti-offset powder • Feed. PAPER MILL BRUSHES: Conveyor Cleaning • Blanket Washer • Fourdrinier Wire Cleaning • Polishing • Coating • Dusting • Dampening • Spray • Sieve • Feed or Carrier • Static Elimination • Flocking • Felt Cleaning • Paint Brushes • Floor Sweeps • Void Detector

Specify Jenkins' METLKOR
the original . . . the best *Metal Core* brush

METLKOR®
CYLINDER BRUSHES
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Serving Industry for 80 Years
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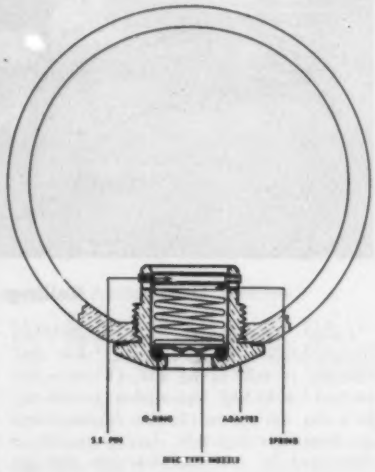
For more data circle 132 on Post Card

for sizes 3, 4, and 5J, at 1750 rpm, are respectively: 1.5; 3.0; 6.0. The lower cost has been obtained by casting the flanges from zinc alloy AG40A, which has a tensile strength of 41,000 psi. Through design simplification, the couplings consist of only three components; two cast flanges and a one-piece rubber sleeve.

A new No. 14 coupling, just added to the regular "Sure-Flex" line, is rated at 500 peak hp at 1750 rpm and will accommodate shafts ranging from 1 through 3-15/16 in.

Larger "Sure-Flex" couplings, No. 11, 12 and 14, now fitted with de-mountable "Sure-Grip" bushings, may be used on different sized shafts throughout their respective size ranges. (Illustrated from left to right: Standard; Bushed; and Junior "Sure-Flex" couplings). *T. B. Wood's Sons Co.*

Circle No. 6 on Readers' Service Card



Fresh-water shower

Said to provide exceptional economy in purchase, operation and maintenance when compared with conventional showers, the Econo-Miser features unusual simplicity in its design and parts.

Spray-disc nozzles may be quickly changed by hand, after the adapter is removed; they are available with orifice sizes for any desired volume. Operation of the Econo-Miser is reported to be efficient at all pressures up to 300 psi and higher. Water is released as a fan, cone or needle spray. *Lodding Engineering Corp.*

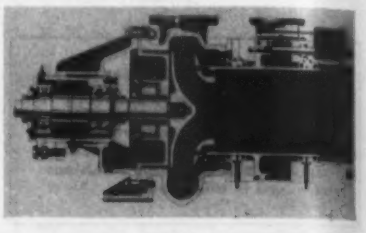
Circle No. 7 on Readers' Service Card

Nickel-alloy steels

Nominally identified as 25-per cent nickel steels, these new alloys are said to achieve unique properties by air cooling from the heat treating temperatures. Yield strengths are reported in excess of 250,000 psi with 6 to 10 per cent elongation. Maximum hardness in excess of 67 Rockwell C has been obtained.

Another unusual feature of the product is its weldability in the hardened condition without pre-heat. It is readily "hot worked" and can be produced in all the various commercial shapes such as bars, plate, sheet, tubing, etc. While not available commercially at present, it is expected that, ultimately, they will be produced by a number of steel manufacturers. *International Nickel Co. Inc.*

Circle No. 8 on Readers' Service Card



Pneumatic control system

An improved pneumatic control system has been announced for Allis-Chalmers' adjustable-capacity, adjustable-pressure (ACAP) pumps. The new system, which is said to automatically adjust the cylinder of these single-stage, single-suction pumps in seconds by air pressure, reduces installation and maintenance costs.

Features of the simplified air control include an oil-mist lubricator located in the incoming air line, double seals which safeguard stock against possible contamination by air and keep liquid from entering the air chamber, and gears or control motor are not required. The new control system is available on ACAP pumps in sizes up to 10-in. discharge. Larger sizes will be considered. *Allis-Chalmers Mfg. Co.*

Circle No. 9 on Readers' Service Card

Transducer

The Dyna-Servo, a high-precision, high-torque, electronic transducer, converts a measurement of pressure, liquid level, temperature, mechanical motion, etc., into a shaft position for the operation of transmitting slide-wires, alarm switches, analog to digital encoders, deviation contacts, etc.

Available attachments include retransmitting slide-wires, a deviation detector for actuating digital transmission equipment, switches for alarms, and a multi-position, range-change switch for changing slide-wire resistance. *Bristol Co.*

Circle No. 10 on Readers' Service Card

Pierced metal sheet

A new pierced metal sheet known as Conidure, is said to last up to three times

How B&W JOB-MATCHED TUBES provide long service life in stainless steel

When you specify B&W Stainless Heat-Exchanger Tubes—either seamless or welded—you can count on:

- ...a complete range of stainless grades to meet any set of service conditions
- ...a wide variety of diameter and wall thickness combinations for all types of operating requirements
- ...fully annealed tubes for maximum resistance to corrosion

These are just a few of the reasons it pays to specify B&W Job-Matched Stainless Steel Heat-Exchanger Tubes. Call your local B&W District Sales Specialist, or write for Bulletin TB-329 for full information. The Babcock & Wilcox Company, Tubular Products Division, Beaver Falls, Pennsylvania.

B&W

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Seamless and welded tubular products, solid extrusions, seamless welding fittings and forged steel flanges—in carbon, alloy and stainless steels and special metals

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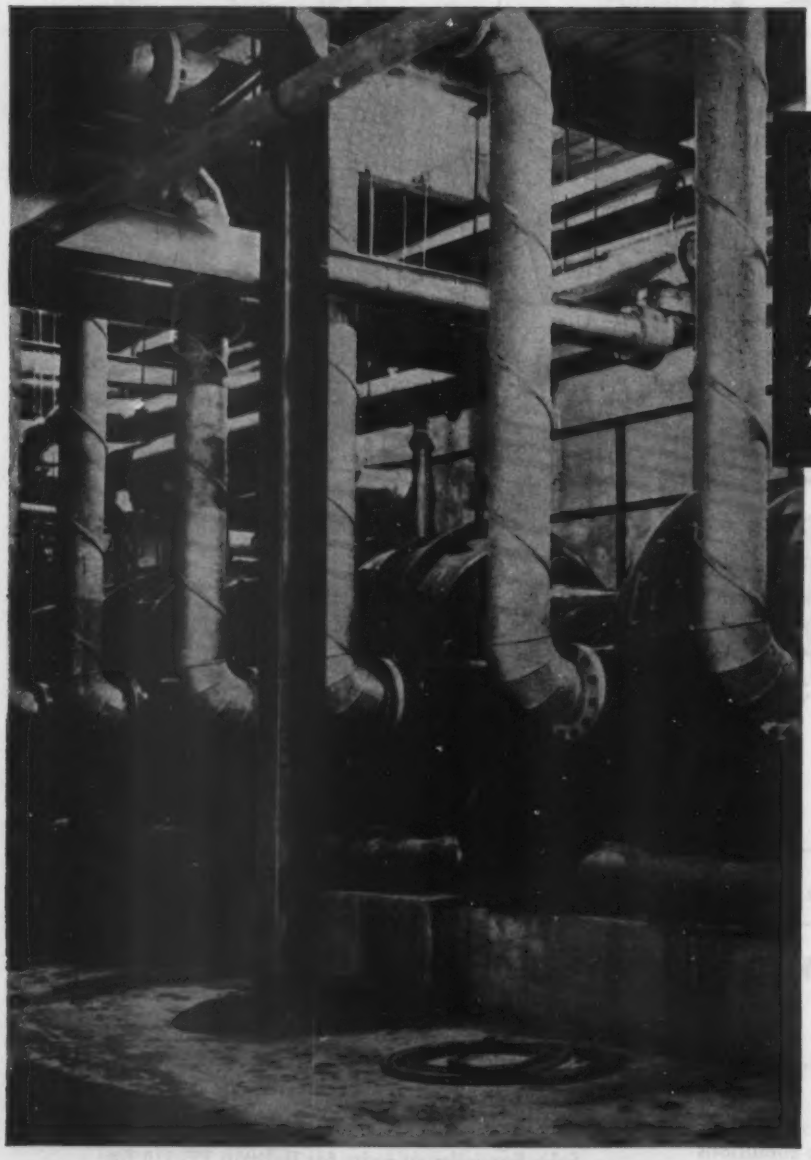
FITS YOUR PIPING PICTURE...



NAYLOR FABRICATIONS

In Carbon Steel, Alloys or Stainless Steel

When you need pipe, fittings or special piping fabrications, it will pay you to look to NAYLOR fabrication service. Through close-tolerance production, NAYLOR can meet your most rigid specifications —promptly and economically —from carbon steel, alloys, or stainless steel.

NAYLOR pipe sizes range from 4" to 30" in diameter and wall thickness from 14 to 8 gauge.

Special piping fabrications from 3" to 44" in diameter and wall thickness up to ⅜".

Standard fittings are available from stock.

Write for Bulletin No. 59 or send specifications for quotation.

NAYLOR PIPE *Company*

1233 East 92nd Street, Chicago 19, Illinois

Eastern U. S. and Foreign Sales Office: 60 East 42nd Street, New York 17, N. Y.

For more data circle 134 on Post Card

HANCHETT SLITTER KNIFE GRINDER (Wet Grind)

SK-24

for CIRCULAR
Top or Bottom SLITTER KNIVES
(of all types)
Full Automatic or Semi-Automatic
Reasonably Priced

This Machine GUARANTEES:

CONCENTRICITY (running truth) to .0005
SHARP — CLEAN CUTTING KNIFE EDGES
LONGER MILL LIFE (less changes)
POSITIVE — ACCURATE FIXTURING
FINEST MICRO INCH FINISHES
CAPACITY — 2½" to 24" DIAMETER

Let us prove the value of this machine:
Send us your knives for test grinding.
There's no obligation.

HANCHETT MANUFACTURING COMPANY

World's Largest Manufacturer of Knife Grinding and Saw Sharpening Machinery

MAIN OFFICE — Big Rapids, Michigan WEST COAST — Portland 1, Oregon

For more data circle 135 on Post Card

New Products . . .

longer than perforated metal used for screening, recovering or de-watering coal, aggregate, chemical solutions and similar solids-bearing liquids passing through gravity or centrifugal separators. With screening and de-watering applications in many industries including paper and pulp, Conidure is available in carbon or stainless steel, copper, brass or aluminum.

Sheet thickness can be up to seven times hole dia. Hole dia. range from 0.004 to 0.099 in.; sheet thicknesses, from 0.014 to 0.079 in. Conidure pierced metal is available in sheets up to 31 in. wide or formed into sheared shapes, cones, segments and cylinders. It can be tensioned and made with clamping grooves or turned edges. *Cross Perforated Metals, National-Standard Co.*

Circle No. 11 on Readers' Service Card

Regohm transducer

The Regohm transducer, a new variable-resistance device for use in the production of pulp and paper, is said to be capable of directly controlling up to 250 w. of power in response to mechanical movement as small as .0001 in. Specific applications are numerous. They include the control of speed and tension of paper as it winds onto reels, the rate at which raw materials are handled, temperature and liquid flow. *Electric Regulator Corp.*

Circle No. 12 on Readers' Service Card

Band saw grinders with attachments

The Series "A" band saw grinding machines, recently placed on the market, are now available with attachments for full universal saw sharpening applications. The two attachments are both continuously variable mechanisms; one of them adjusts lift, and the other, feed. The adjustments, controlled by means of handwheels, may be made while the machine is in operation.

The two attachments can now be furnished with models A-220 (illustrated), A-230 and A-240, which have respective capacities of 12, 14 and 16 in. *Hanchett Mfg. Co.*

Circle No. 13 on Readers' Service Card

New web press

Called the Karr Model P-50, this new unit is an automatic, multi-purpose, high-speed, die cutting web-fed press for blanking, punching and scoring. Adapatable to paper, plastic and metal stock, the press is said to be capable of handling a 50-in. web width of stock and is quite versatile in its application to the production of folding boxes, food trays, cereal boxes, milk cartons, etc., in stock thicknesses from .0005 in. to any available thickness in web or roll form.

The P-50, with speeds reported up to 200 platen strokes/min., is (at its maximum, with automatic sheeter) capable of producing 12,000 sheets, 50 by 50 in./hr. The press can be furnished with printers for printing both sides at one time or one side in one or more colors. Embossing equipment, stitchers and gluers are also available. *Karr Engr. Service Inc.*

Circle No. 14 on Readers' Service Card

Pressure feeder

A unique, counter-rotating, intermeshing-screw pressure feeder is said to greatly increase the capacity and versatility of screw presses. Stainless steel or other corrosion resistant materials are used for all parts of the feeder that come in contact with material being processed.

Capable of handling a wide variety of materials, the No. 564 pressure feeder has many possible applications in such industries as pulp and paper, chemical, food and oil-seed processing. The unit facilitates the feeding or loading of bulky, low-density materials and extremely wet materials of a fibrous nature which cannot be handled satisfactorily by conventional feeders. *Bauer Bros. Co.*

Circle No. 15 on Readers' Service Card

Pump for corrosive chemicals

An electrically driven, diaphragm-type pump, for the accurate proportioning of concentrated corrosive chemicals, is now available.

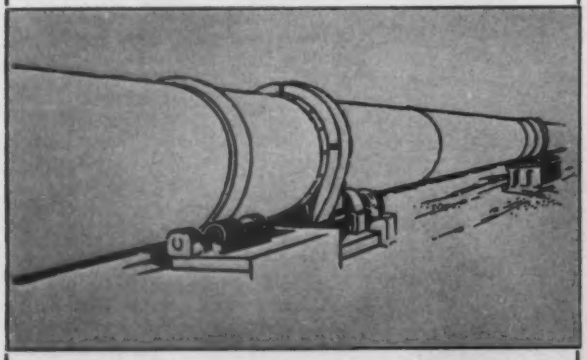
Model 1331 Proportioneers Chem-O-Feeder, made of corrosion-resistant materials, is said to effectively meter such chemicals as 66° Baumé sulfuric acid, sodium hydroxide, phosphoric acid, photographic solutions, etc. Featuring adjustable stroke length while in motion, the pump is ideal for the chemical and air-conditioning fields and general industry. *B-I-F Industries Inc.*

Circle No. 16 on Readers' Service Card

Rectifier conversion unit

A silicon rectifier conversion unit has been developed for use in high-voltage dc power supplies on electrostatic precipitators that collect fly ash and dust particles in industrial plants and electric utility generating stations. The new unit is said to eliminate costly maintenance of mechanical

REBURNING LIME SLUDGE?



DO IT BEST WITH A VULCAN KILN

All equipment made by Vulcan must measure up to the standard of quality and responsibility it has taken 111 years to earn. Contact Vulcan today . . . estimates, constructive suggestions and preliminary drawings will be furnished (as far as possible) without obligation.

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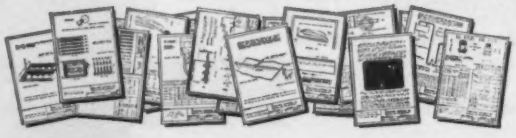
"The Oldest Name In Rotary Kilns"

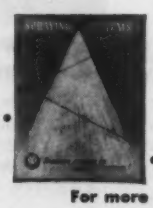
For more data circle 136 on Post Card

got a SPRAY NOZZLE problem?

perhaps one of our DATA SHEETS can suggest a solution

For almost every spraying application, there's a Spraying Systems Data Sheet that gives useful information on suggested installations and types of nozzles to use. If you have a problem, write and let us know the application involved . . . and we'll send the Data Sheet that applies.

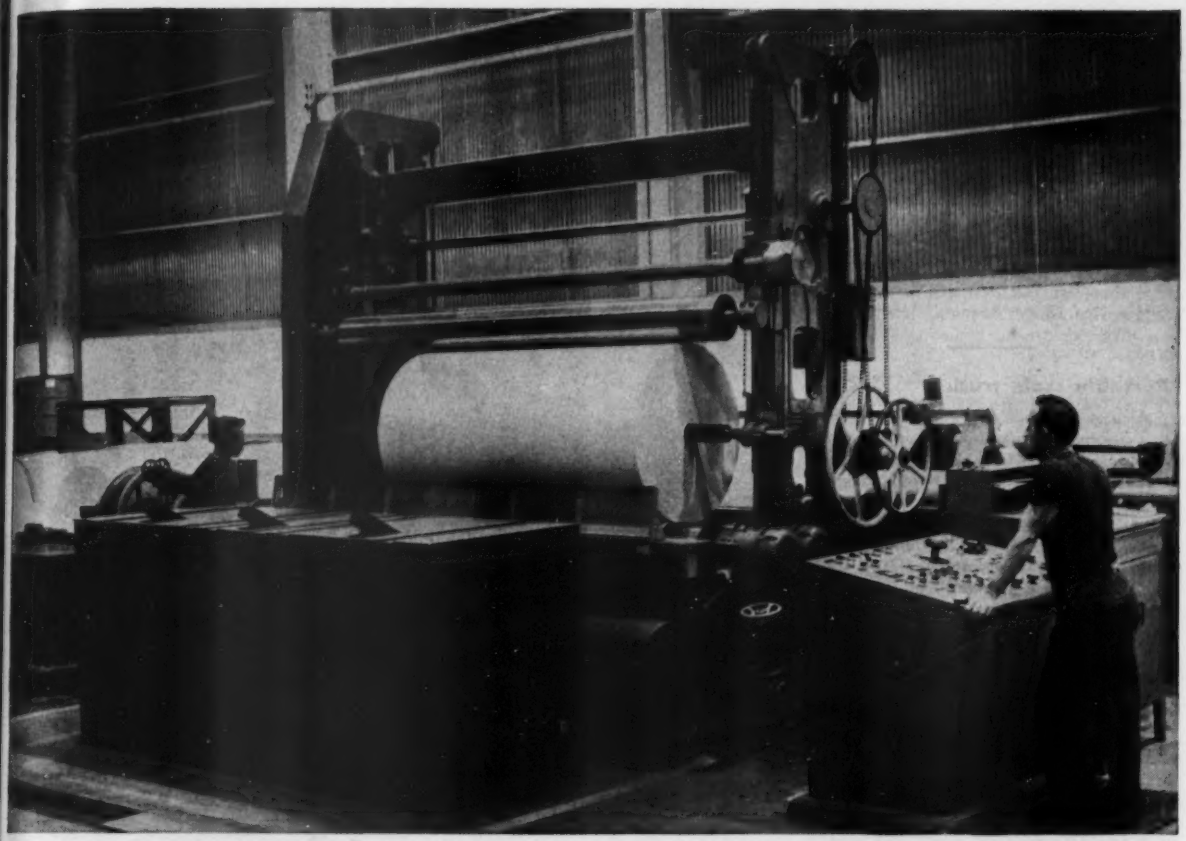




SPRAYING SYSTEMS CO.
3254 RANDOLPH STREET • BELLWOOD, ILLINOIS

And . . . for complete spray nozzle information, write for Catalog 24.

For more data circle 137 on Post Card



One of the two 104-in. Langston Slitters and Winders in the Glatfelter mill completing rewind. Roll drop table in foreground is up, ready to receive roll when ejected by the winder, and chocks are in raised position to stop the roll. Note console incorporating all major indicators and controls.

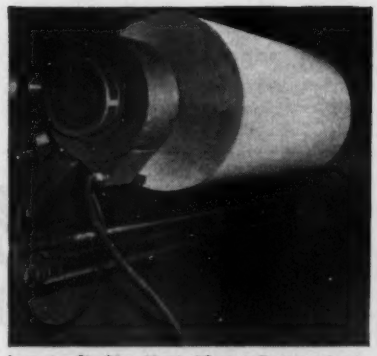
Langston Slitters and Winders turn out tight, even rolls at Glatfelter Mill

Two 104-in. Langston Slitters and Winders have been working in the new mill of P. H. Glatfelter Co., Spring Grove, Pa., for more than a year. They have proved themselves in round the clock production on grades from fine papers to book.

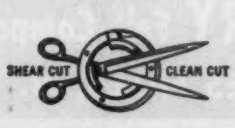
One of the most important features, according to the company, is the constant tension unwind control on the Langston Shaftless Roll Stand, which keeps the tension constant throughout the winding operation. Perfect rolls can be turned out from 9 to 100-lb. stock in roll widths from 7½ to 104 in.

The equipment can be quickly loaded and lined up on the back stand and is designed for easy threadup and gang slitter setting. Hydraulic roll ejectors move the finished rolls quickly from the winding position to the roll drop. Other features include shearcut slitters to eliminate dust; many interlocked controls for extra safety; automatic edge guide control to allow precision trim rewinding of narrow and salvage rolls.

Find out how Langston Slitters and Rewinders can benefit you. Write SAMUEL M. LANGSTON Co., 6th & Jefferson Sts., Camden 4, N.J.



Langston Shaftless Unwind Stand eliminates back-breaking, time-consuming task of hoisting heavy shafts into place. Hydraulically operated arms reach out, pick up the roll, and raise it into running position—a 1-man, pushbutton operation.



LANGSTON leadership...by design

For more data circle 138 on Post Card

New Products . . .

rectifiers and replacement of tube-type rectifiers.

The conversion units are available for use with rectifier transformers rated up to 75,000 v. RMS and up to 45 KVA in full-wave bridge rectifier circuits. *General Electric Co.*

Circle No. 17 on Readers' Service Card

Portable scale truck

A portable scale truck, now available, that incorporates a scale as an integral part of a hydraulic footlift hand truck, enables commodities to be moved and weighed simultaneously. The truck is built with special lifting angles to hold the scale.

This combined operation eliminates multiple handling of loads, and avoids the time consumed in handling the material on the truck and then taking the material and truck over to a scale to get the weight reading. *Lewis-Shepard Products Inc.*

Circle No. 18 on Readers' Service Card

Penntrowel

A corrosion-resistant, thermosetting floor covering, called Penntrowel, has been engineered for all types of plant floors, walls, foundations and piers.

When mixed, Penntrowel has a butter-like consistency which can be troweled on both horizontal and vertical concrete, brick or cement block surfaces. Said to form a stronger bond than the surface being covered, it seals out moisture, which prevents scaling or sloughing off. Depending on conditions, thicknesses range from 1/16 to 3/16 in.; average thickness is 3/32 in. *Pennsalt Chemicals Corp.*

Circle No. 19 on Readers' Service Card

Clamp paper cutters

Three new automatic-clamp paper cutters (34½, 42 and 52 in.) feature hydraulic clamping, standard or automatic spacer operation and are economically priced. The machines are reported to have a 42 stroke/min. knife speed, with efficient right-to-left knife action. The shear angle is long and low for cutting smoothly and accurately through heavy lifts. Clamp openings range from 4½ in. on the 34½-in. machine through a generous 6 in. on the 52-in. machine.

With one-piece cast machine bodies and sturdy reinforced cutting tables, these units have many other advantageous features which include two-hand operation, photo-electric safety beam, micrometer handwheel adjustment, etc. *Lawson Co. Div., Miehle-Goss-Dexter Inc.*

Circle No. 20 on Readers' Service Card

Ream rotator

A new ream rotator which can be incorporated into automatic cut-size finishing systems, also permits automatic reversal of the sheets before wrapping.

Completely automatic in operation, the ream rotator can be set to pass through or rotate the ream, has a reported maximum capacity for sheets 9 in. wide by 13 in. long, and a 7-in. opening. *Lamb-Grays Harbor Co. Inc.*

Circle No. 22 on Readers' Service Card

Rotary valve actuator

The SM-11, a new, electric, rotary valve actuator, provides both high accuracy and response for the control of hydraulic valves and process control. This 5-in. long, 4½-in. dia. actuator is said to develop torques of 125 in. lb. and provides full-scale control in as little as one second with remote-control accuracies of one part in 1000.

Design features include enclosed and lubricated gear trains, weather-proof construction (explosion-proof also available) and a motor with ample heat sink to permit continuous operation at locked rotor current. *Jordan Controls Inc.*

Circle No. 21 on Readers' Service Card

Kalamazoo

WOOD TANKS

Built from best tank grade lumber. Backed by over 90 years' tank building experience. *Kalamazoo* can give you what you want. Free estimates and suggestions. Write today.

WOOD TANK DIVISION

Kalamazoo TANK and SILO COMPANY

360 HARRISON ST., KALAMAZOO, MICHIGAN

For more data circle 139 on Post Card

The Trade-Mark of DEPENDABLE FELTS

The WATERBURY Felt Company

SKANEATELES FALLS, N. Y.

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PUT ACTION IN YOUR SAFETY PROGRAM

Add a touch of showmanship to your safety program. Films let you tell your training story with the dramatic impact of pictures . . . action . . . sound. You can cut your safety training in half, give fewer refresher courses and get better results by using training films.

Here are three film sets that will help you arouse and keep alive interest in your safety program. And there is no better way to teach foremen how to be better supervisors.

SPEAKING OF SAFETY

A brand new set of films that will teach your foremen and supervisors the tips they should know about making safety talks, and how to transmit management's ideas and plans. Six 35mm sound slidefilms and leader's manual in an attractive leatherette case.

HUMAN FACTORS IN SAFETY

This is a series of six 35mm sound slidefilms with leader's manual that may be used for an advanced safety course. Each film deals with one aspect of the complex art of handling people. Collectively, the films show how to train workers, how to keep experienced people on their toes and how to win respect, cooperation and loyal support.

SAFETY MANAGEMENT FOR FOREMEN

A set of ten 35mm sound slidefilms—all that is needed for a course in safety fundamentals. The films explain how to organize a safety program, what part the foreman plays in the program and how safety increases production. They also discuss specific safety activities, such as machine guarding, safety inspections, the first aid program, etc. Complete with leader's manual in an attractive leatherette case.

Write for complete information and details to the

NATIONAL SAFETY COUNCIL

425 North Michigan Ave., Chicago 11, Illinois

For more data circle 141 on Post Card

NEW LITERATURE

Books

A PRIMER OF THE THEORY OF ADMINISTRATION, by Jaroslav Tuma. Published by Mathrawala & Sons, 219, Frere Road, Fort, Bombay - 1, India. 73 pp. $1.50.

The subject matter of this book has been divided into three parts; the functional, social and operative features, each one dealing with a kind of preliminary set of conditions, on the base of which administration is supposed to operate.

The functional feature gives the survey of characteristics to which the enterprise has to conform, in order to fulfill its mission. The social features indicate requirements on the individual and on the relations to be established between individuals in order to guarantee a sound social climate within the enterprise. The operative features define the composition of the body corporate, the kind of its functional and local organization and the methods used for the performance of work.

INVESTING AND LICENSING CONDITIONS IN 34 COUNTRIES. (1959 edit.) Prepared and published by Business International, 200 Park Avenue South, New York 3, N. Y. 108 pp. $60.00.

This report shows where conditions in 34 major world markets favor investors and licensors and where there are dangers. A country-by-country analysis is given of the laws and regulations governing investments and licensing agreements and tells how they are applied in practice to American companies.

The present edition, 4th in the series, covers Ghana, Luxembourg and the United Arab Republic for the first time. Cuba, previously included, has been dropped because of unpredictable conditions on the island.

Booklets

CAPITAL AND INCOME SURVEY OF THE U. S. PULP & PAPER INDUSTRY—1939-1958, a report of which a limited number of copies are available, may be obtained from the American Pulp & Paper Association, 122 East 42nd St., New York 17, N. Y. The survey presents an analysis of the financial operations of the sample of 46 integrated companies and 42 non-integrated companies. Also shown are government statistics on the financial data of the entire paper and allied products industries as well as similar data for the pulp, paper and board sector.

AMERICAN STANDARD PALLET SIZES, a booklet that can help to solve a materials handling problem encountered in most industries using lift trucks, provides for 8 rectangular and 3 square standard pallet sizes. The principal objective of the new American Standard is to provide an adequate selection from a minimum number of sizes and to provide the maximum efficiency, economy, interchangeability and flexibility in U. S. rail, truck, air and maritime service. The publication includes a series of charts (or areagrams) for various standard carriers and, in addition, charts with which to compute volumetric efficiency in relation to height of load. American Standard Pallet Sizes, MH1.1-1959, is available at $2.00 a copy from the American Society of Mechanical Engineers, 29 West 39th St., New York 18, N. Y., or the American Standards Association, 70 East 45th St., New York 17, N. Y.

USDA Reports

THE FOLLOWING STATION PAPERS are obtainable from M. B. Dickerman, director of the Lake States Forest Experiment Station, U. S. Dept. of Agriculture Forest Service, St. Paul 1, Minn.: No. 72, Direct Seeding and Planting of Balsam Fir in Northern Wisconsin; No. 73, Seed Production Areas in the Lake States (Guidelines For Their Establishment and Management).

THE FOLLOWING RESEARCH NOTES may be obtained from Joseph F. Pechanec, director of the Southeastern Forest Experiment Station, U. S. Dept. of Agriculture Forest Service, Asheville, N. C.: No. 130, Wet Site Survival and Growth; No. 131, Site Index Curves for Southern Appalachian White Pine Plantations; No. 132, Response of Planted Yellow-Poplar to Di-ammonium Phosphate Fertilizer; No. 133, Site Index Curves for South Florida Slash Pine; No. 134, Sapstreak Disease of Sugar Maple and Yellow-Poplar in North Carolina; No. 135, Site Index Curves for Piedmont Virginia Pine; No. 136, Pulpwood Price Trends in the Southeast; No. 137, Monoammonium Phosphate Shows Promise in Fire Retardant Trials.

Manufacturers' Publications

These items are numbered for your convenience. Copies of the publications may be requested at no obligation through our Readers' Service Dept. Use the handy business reply card which accompanies this issue.

Technical reprint

Graver Water Conditioning Co. is offering a ten-page technical reprint which discusses methods for automatic control of water treatment plants. Divided into two sections, part I deals with control of demineralization plants and covers a wide range of subjects including "stepless" re-

Save Man Hours

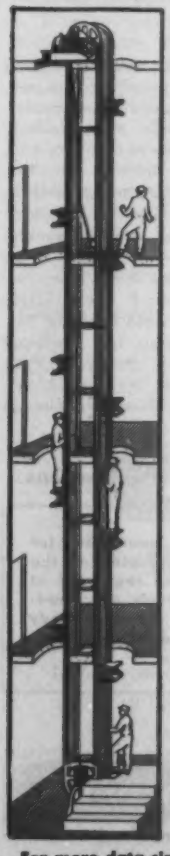
Equip Your Digester House with a

HUMPHREY

Employee's Manlift

ELEVATOR

Eliminate stair climbing — save time — reduce employee fatigue. The endless belt provides continuous up and down transportation to and from sampling and operating floors. Easy and safe to operate with ready-at-hand stop and go controls and the exclusive Humphrey Safety Features.



Can be installed in any Multi-Floor Building

Send us your requirements . . . we'll furnish complete information and prices.

HUMPHREY ELEVATOR COMPANY

Inc.

346 1st Ave. N.W.

Faribault, Minnesota

Humphrey is the original Manlift Elevator, made continuously since 1887.

For more data circle 142 on Post Card

generation, quality control of effluent, conductivity, pH control, automatic regeneration, and the use of multiport and piston-operated valves. Part II considers control of cold process softening and clarification units, hot-process-hot zeolite systems and sodium zeolite systems. The article finishes with a review of panelboards and recent developments in the field of control which include silica recorders, monitors, solid-state controls and the new Graver automatic tape analyzer.

Circle No. 23 on Readers' Service Card

Trackmobile booklet

Whiting Corp. is offering a pocket-size, 32-page booklet which shows the cost-cutting versatility of the Trackmobile. The booklet is fully illustrated, showing the Trackmobile as a road truck which, by dropping a separate set of wheels, is quickly converted to a track vehicle for switching, spotting or hauling freight cars. The unit is also illustrated as a functioning snow plow and a materials handling truck.

Circle No. 24 on Readers' Service Card

Micro adjustable orifice

Stickle Steam Specialties Co. is offering a bulletin on their series 600 micro adjustable orifice, a condensate flow regulator that operates without moving parts and provides continuous, visible circulation. The descriptive text is supplemented with a photograph and a labeled cutaway of the regulator.

Circle No. 25 on Readers' Service Card

Roll deflection chart

Frank W. Egan & Co. welcomes your request for a free slide rule (roll deflection chart) which simplifies calculation of the deflection of rolls, made from various materials, under a given load. Conversely, the slide rule can be used as a design supplement in order to compute the proper roll dia. for a given condition and for the desired maximum deflection. It is also helpful in determining proper amounts of crown.

Circle No. 26 on Readers' Service Card

Manual on mill agitation

Mixing Equipment Co. Inc. has published a 112-page manual entitled, Agitation in Mixing for Pulp and Paper Mills. The book is devoted exclusively to agitation and mixing in the mill. The text is tab-indexed and is divided into four sections: Stock Agitation; Pulping Liquors; Coating Systems; and Equipment Design.

Circle No. 27 on Readers' Service Card

Industry bulletin

Minneapolis-Honeywell Regulator Co., Industrial Division, is offering a 24-page bulletin that consists of compiled article reprints. Offering some case histories of how instruments are applied to industrial waste treatment systems to prevent pollution, the bulletin should be particularly helpful to anyone similarly confronted with pollution prevention problems.

Circle No. 28 on Readers' Service Card

Ductile iron pipe

James B. Clow & Sons Inc. welcomes your request for their newly published booklet on ductile iron pipe and fittings. The 20-page booklet, designed to be helpful in solving pipe-corrosion problems in industries where piping is exposed to extreme chemical and acid conditions, contains tables on the physical and metallurgical properties of ductile iron pipe and compares its corrosion resistance in various media. Specifications are also given for Clow ductile iron pipe and fittings with flanged joint, Bell-Tite joint and with plain or threaded ends.

Circle No. 29 on Readers' Service Card

Test facilities review

Sprout, Waldron & Co. Inc. is offering a bulletin which reviews test facilities at Consolidated Paper Corporation's Research Center, Grand' Mere, Quebec. This reprint article tells how improved research facilities make it possible for a company to pre-test equipment and methods.

Circle No. 30 on Readers' Service Card

The Paper Industry
Professional and Business Services

J. E. SIRRINE COMPANY

ENGINEERS Since 1902

GREENVILLE, SOUTH CAROLINA

Design		Consultations
Paper & Pulp		Reports
Water & Waste		Appraisals
Steam & Hydro Power		Steam Utilization

Carloading check charts

Signode Steel Strapping Co. is offering a freight carloading check chart for wall anchored, free floating and controlled floating loads. Designed to assist shipping room and loading dock personnel in the proper way to clean, drape strapping and load box cars, the charts provide clear, simply illustrated information on carloading procedures for these types of loads.

Circle No. 31 on Readers' Service Card

Pyrex drainline system

Corning Glass Works welcomes your request for their 12-page, illustrated bulletin on the pyrex drainline system for disposal of corrosive wastes. The bulletin contains product and property data, information on making joints and hanging and a complete list of available fittings. Schematic drawings and tables are included. A sample specification is printed for use by architects, engineers and plumbing contractors.

Circle No. 32 on Readers' Service Card

Reference table

Bag Div., St. Regis Paper Co., is offering a wallet-size reference table for converting the bag-per-min. rate of filled multiwall bags to tons-per-hr. The table, designed as a ready guide for production, materials handling, purchasing, research and engineering planning personnel, lists the ton-per-hr. rate of from 1 to 30 bags per min. for 100-, 80- and 50-lb. bags. The table can be used by most industries that package their products in multiwall bags.

Circle No. 33 on Readers' Service Card

"Uni-Pac" demineralizers

Cochrane Corp. is offering a bulletin on their new line of standardized, "Uni-Pac" packaged, mixed bed demineralizers. The 4-page brochure contains information on the use of the demineralization process in the elimination of variables from water and the consequent benefits for product quality control. The bulletin includes a labeled diagram and a specification table for various models.

Circle No. 34 on Readers' Service Card

Reprinted technical paper

Mellon Institute welcomes your request for the reprint of a technical paper on animal-glue testing for paper sizing, by P. B. Davidson and H. B. Bodenhagen. Containing 11 Figures and 8 Tables, the 14-page study is concerned with what glue properties are required for tub sizing of technical papers and the development, if possible, of test methods that will serve for the proper evaluation of animal glue. The major paper properties considered are: Sizing efficiency; Wet-strength; Coating, i.e. — photosensitive coatings with blueprint, diazo and negative solutions.

Circle No. 35 on Readers' Service Card

CHARLES P. RAYMOND SERVICE, Inc.

THE POSITION YOU WANT may be available right now. The demand for executives is increasing. Salaries are attractive. You are invited to send us your resume in confidence.

THE EXECUTIVE YOU NEED may be listed with us. Employers find our Service helpful and time saving.

Your phone call, wire or letter will bring prompt attention. LIberty 2-6547 — 294 Washington St. — Boston 8, Mass.

RETIRING?

Add to your retirement income by making your paper mill knowledge pay off. Spare time. No selling. Write Box 690, The Paper Industry.

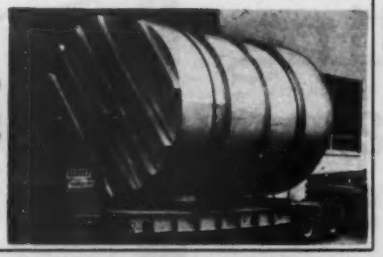
HELP WANTED

Paper chemist with mill experience in paper and coating wanted for technical sales service. Willing to travel as required. Send resume, photograph and salary required. Replies will be treated in strict confidence. Box 696, The Paper Industry.

OVERLY'S INCORPORATED

BOX 468
NEENAH WIS.

CUSTOM FABRICATED
TANKS
STAINLESS STEEL



For more data circle 143 on Post Card

WILLIAMS-GRAY COMPANY
221 North LaSalle Street
Chicago 1, Illinois

Serving the Paper Industry
1906

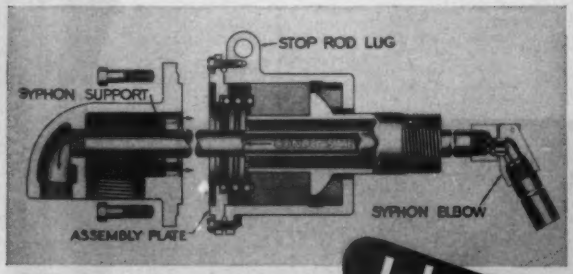
PAUL FOSTER
PETER TALBOT
HERB FISHBURN
WES GALLUP
BILL FRENCH

Lindsay Wires
Knox Woolen Felts
Mount Vernon Dryer Felts

Carrier Rope, Splicing Tissues, Deckle Webbing, Apron Cloth, Wire Brushes

For more data circle 144 on Post Card

Rotary Joint Headquarters ★ Johnson started the whole idea. Today's *complete* line includes sizes from ¼" to 8" . . . self-supported, pipe-supported, or rod-supported . . . for stationary or rotating syphon pipe . . . all operating speeds and pressures . . . for paper machines, calenders, corrugators, waxers, embossers, roofing machines, printing presses.



Type SDP shown. Hinged syphon elbow replaces unwieldy curved syphon pipes with two straight pipes. Newest Johnson development is the Quick Release nipple. Write for Bulletin S-3001.

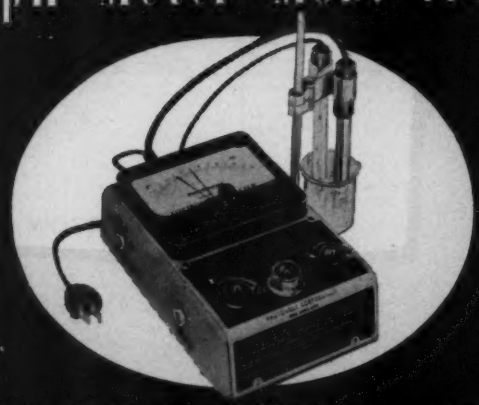
Johnson Rotary Pressure Joints

First in the Paper Industry

THE JOHNSON CORPORATION
843 Wood St., Three Rivers, Michigan

For more data circle 145 on Post Card

PHOTOVOLT
pH Meter MOD. 115



A full-fledged line-operated pH Meter of remarkable accuracy at the moderate price of $175.-

Write for bulletin 115 to

PHOTOVOLT CORP.
95 MADISON AVE NEW YORK 16 N Y

For more data circle 146 on Post Card

APPLETON
WIRES
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GOOD
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a leading
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of wires
for
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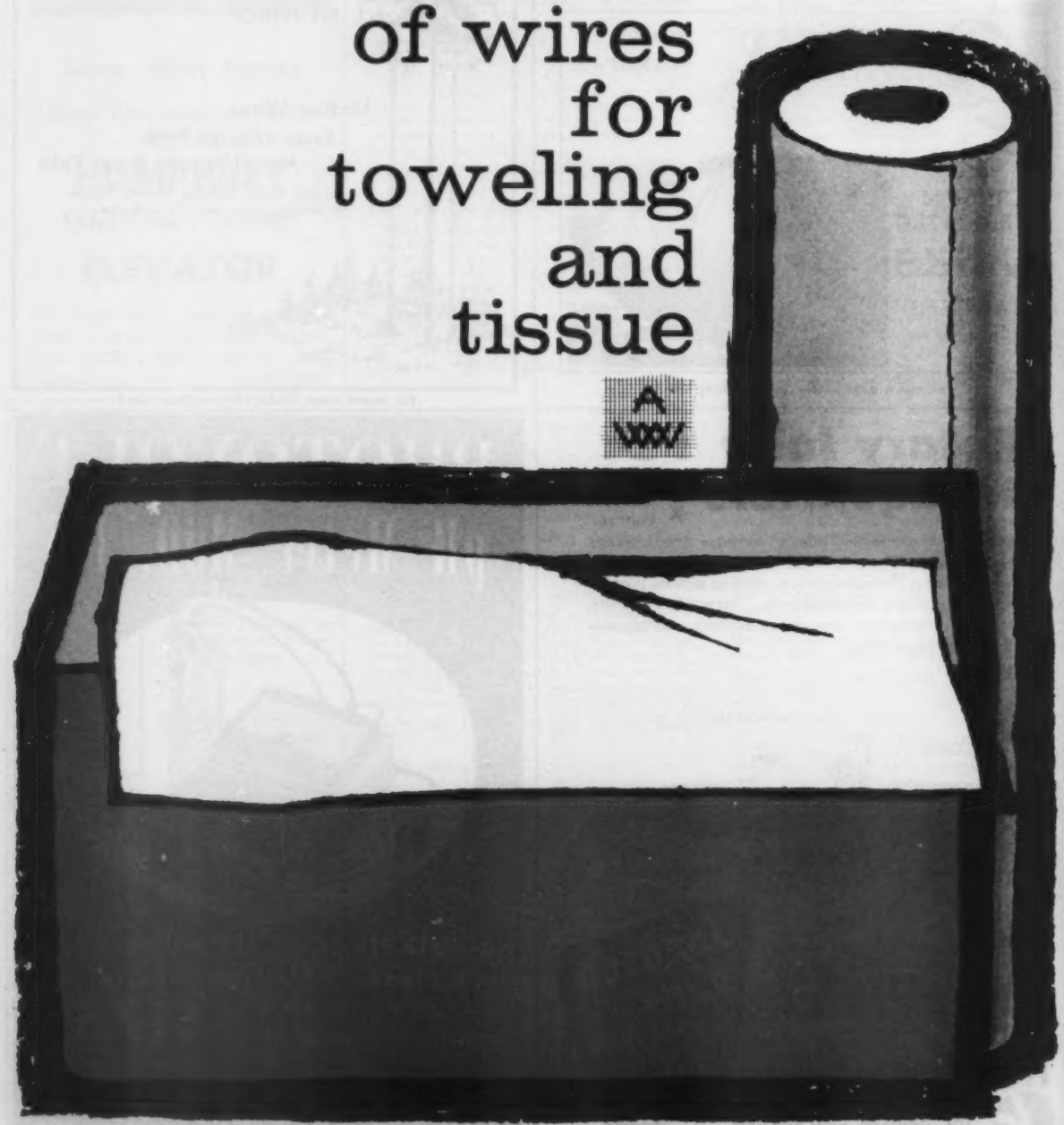

APPLETON WIRE WORKS CORP., PLANTS AT APPLETON, WIS. AND MONTGOMERY, ALA.: INTERNATIONAL WIRE WORKS, MENASHA, WIS. AN AFFILIATED COMPANY

For more data circle 147 on Post Card

MARKET QUOTATIONS

RAGS (Domestic)

New Cotton Cuttings

The following are brokers' and large dealers' average buying prices for sizeable lots in cents per pound f.o.b. New York:

	per cwt.
No. 1 white shirt cuttings	13.00— 13.50
Soft unbleached muslins	15.50— 16.00
Fancy shirt cuttings	4.50— 5.00
No. 1 percales	5.50— 6.00
No. 1 washables	2.25— 2.50
No. 1 light silesias	6.50— 7.00
No. 1 light prints	4.75— 5.00
Light flannelettes	6.50— 7.00
Cottonades	2.75— 3.25
Blue overall cuttings	6.75— 7.25
Blue cheviots	6.75— 7.25
Canton flannels, bleached	10.50— 11.00
Canton flannels, unbleached	10.50— 11.00
Osnaburg cuttings	9.50— 10.50
Underwear cuts, bleached	14.50— 15.00
Underwear cuts, unbleached	14.50— 15.00
Sun tan khaki cuttings	5.00— 5.50
American linen cuttings	6.75— 7.25

Cotton Rags

The following are prices, cents per pound, paid by dealers and brokers f.o.b. New York:

	per cwt.
No. 1 roofing (Chicago)	.60— .65
No. 2 roofing (Chicago)	.50— .55
Twos and blues, repacked	1.50— 1.75
Thirds and blues, repacked	1.50— 1.75
No. 1 whites, repacked	—
No. 1 whites miscellaneous	—
No. 2 whites, repacked	—
No. 2 whites, miscellaneous	—

RAGS (Foreign)

(ex dock New York City)

New Rags

per cwt.

Nominal:
- New dark cuttings
- New mixed cuttings
- New light silesias
- Light flannelettes
- Unbleached cuttings
- New white cuttings
- New light oxfords
- New light prints

Old Rags

per cwt.

Nominal:
- No. 1 white linens
- No. 2 white linens
- No. 3 white linens
- No. 4 white linens
- No. 1 white cottons
- No. 2 white cottons
- No. 3 white cottons
- No. 4 white cottons
- Extra light prints
- Ordinary light printe
- Medium light prints
- Dutch blue cottons
- French blue cottons
- French blue linens
- Checks and blues
- Linsey garments
- Dark cottons
- Old shopperies

ROPE and BAGGING

F.o.b. and ex dock New York City

Gunny No. 1, domestic	—
Gunny No. 1, foreign	—
No. 1 manila rope, domestic	—
No. 1 manila rope, foreign	—
New burlap cuts (soft)	—
Sisal strings	—
Mixed strings	—

WASTE PAPER

The following are prices, dollars per net ton, paid by brokers and large dealers for carload quantities of baled stock, f.o.b. cars New York:

No. 1 hard white envelope cuttings	95.00—100.00
No. 1 hard white shavings	75.00— 80.00
No. 1 soft white shavings	50.00— 55.00
Soft white shavings, uncoated	60.00— 65.00
Fly leaf shavings No. 1	30.00— 35.00
Fly leaf, woody, No. 1	25.00— 27.50
Mixed colored shavings	21.00— 23.00
No. 1 books and magazines	22.00— 23.00
Ledger stock, white, No. 1	45.00— 50.00
Ledger stock colored, No. 1 (Midwest ship)	40.00—
New manila envelope cuttings (free of groundwood)	70.00— 75.00
New manila envelope cuttings (containing groundwood)	50.00— 55.00
Manila tab cards	70.00— 75.00
Colored tab cards	50.00— 55.00
New northern kraft envelope cuttings	65.00— 70.00
Triple sorted kraft, 100%	35.00— 37.00
No. 1 old kraft	30.00—
White news cuts, No. 1	55.00— 57.50
No. 1 overissue news	17.00— 19.00
Folded news, special	15.00— 16.00
Folded news, ordinary	13.00— 14.00
Old corrugated boxes	18.00— 19.00
New jute corrugated cuts	19.00— 20.00
Mill wrappers	11.00— 13.00
Boxboard cuttings	4.00— 5.00
No. 1 mixed paper	6.00— 8.00

CHEMICALS

F.o.b. New York City

Alum, ammonium	
Granular, bags, works, cwt.	4.30—
Lump, drums, works, cwt.	5.05—
Powdered, drums, works, cwt.	5.20—
l-Arginine, drums, kilo	90.00—
Blanc Fixe	
Direct process, bags, c.l., works, ton	145.00—
L. c. l., ton	155.00—
Bleaching Powder, drums, cwt.	—
Casein, domestic acid precipitated	
30-mesh bags, 10,000-lb. lots or more, shipping point, lb.	.56—
80-mesh bags, 10,000-lb. lots or more, shipping point, lb.	.64—
China Clay, domestic dry-ground, airfloat, 99%	
325-mesh bags, c.l., Georgia works, ton	10.00— 12.00
300-mesh bags, c.l., Georgia works, ton	13.50— 14.50
Imported, white, lump, bulk, c. l., ex dock Phila, Portland, Me., gross ton	20.00— .35.00
Chlorine, liquid	
Tanks, single units, works, freight equaled, cwt.	3.15—
Glycerine, refined (CP, USP) 99%, drums c. l., delivered lb.	.30⅞—
Litharge, commercial powdered	
Barrels, c. l., works, freight equaled lb.	.13¾—
Rosin, gum, c. l., f.o.b. New York, cwt.	
K, M	13.20—
N	13.40—
WG	13.70—
WW	14.00—
Rosin, wood, c. l., f.o.b., shipping point, cwt.	
K, M	10.15— 10.40
N	10.35— 10.60
WG	10.55— 10.80
WW	10.88— 11.10
Saltcake, domestic, bulk works, 100% Na_2SO_4 basis ton	28.00—
Soda Ash	
Dense, 58%, paper bags, c.l. works, cwt	1.90—
Light, 58%, paper bags, c.l. works, cwt	1.85—
Soda, caustic	
Flake, 76%, drums, c. l. works, freight equalled, cwt	5.20—
Solid, 76%, drums, c. l. works, cwt.	4.80—
Sodium Silicate	
40°Be, 1:3.2, turbid, drums, c. l., works, cwt.	1.65—
52°Be, turbid, 1:2.4, drums, c. l., works, cwt.	2.65—
Starch	
Pearl, 140-lb. bags, cwt.	7.51—
Pearl, 100-lb. bags, cwt.	7.36—
Powdered, 100-lb. paper bags, cwt.	7.48—
Sulfur, crude	
Bulk, c. l. mine, contract, long ton	23.50—
Talc	
Domestic, fibrous, N. Y., grd., bags, c. l. works, ton	28.00—
Canadian, ground, bags, c. l. works, ton	20.00— 35.00
Titanium Pigment	
Calcium-rutile base, regular, bags, c. l., lb.	.09½—
High-tinting, drums, c. l., lb.	.14½—
Zinc Oxide Pigment, American process	
Lead-free, bags, c. l. freight allowed, lb.	.14½—
Leaded, 35%, bags, c. l., freight allowed, lb.	.15½—

WOOD PULP

Quotations on domestic and Canadian pulp, dollars per short air-dry ton delivered consuming mills including basic allowances, follow:

Bleached sulfite, No. 1	155.00—
Bleached sulfite, Canadian	155.00—
Unbleached sulfite	135.00—
Unbleached sulfite, Canadian	135.00—
Bleached soda	150.00—
Bleached soda, Canadian	150.00—
Kraft, bleached hardwood	152.00—
Kraft, bleached	157.00—
Kraft, bleached southern	160.00—
Kraft, bleached Canadian	160.00—162.50
Kraft, unbleached southern	120.00—
Kraft, unbleached, Far West	125.00—
Kraft, unbleached Canadian eastern	135.00—
Kraft, unbleached Canadian western	120.00—125.00
Kraft, semi-bleached southern	—
Sulfite screenings	—
Sulfate screenings	—

Quotations on imported wood pulp, dollars per short air-dry ton on dock American Atlantic ports, follow:

Bleached sulfite, Swedish, freight allowed	155.00—
Bleached sulfite, Norwegian, del'd with limited freight allowance	155.00—
Bleached sulfite, Finnish, freight allowed	155.00—
Unbleached sulfite, Swedish, freight allowed	135.00—
Unbleached sulfite, Finnish, freight allowed	135.00—
Kraft, unbleached, Swedish, freight allowed	125.00—
Kraft, unbleached, Finnish, freight allowed	125.00—
Kraft, bleached, Swedish, on dock	157.50—162.50
Kraft, bleached, Norwegian	155.00—

PAPER

Quotations are mill quotations Chicago

Boards (prices per ton, delivered in Chicago, 10 tons or more):	
Plain chip	107.50
News vat lined chip	110.00
.009 chip, rolls	100.00
Filled news	111.50
Solid news	114.50
White vat lined chip	144.50
Chip tube and can stock	112.50
Single manila lined chip	162.50
Single jute lined chip	147.50
Container, 42-lb.	
Kraft liner (per 1000 sq. ft.)	2.68
White patent coated	
.020	175.00
.018	177.50
.016	182.50

Book Paper (f.o.b. Chicago, c.l. cases per cwt):	
No. 1 enamels	20.55
No. 2 enamels	19.55
Machine-coated, 45- to 100-lb.	15.55— 19.00
60-lb. + uncoated offset, 25 × 38 (2000 lb.)	22.25
"A" grade English finish untrimmed, 25 × 38 (2000 lb.)	21.10
Rag Content Bond (white, 5000 to 10,000-lb. sub 20, ream sealed cartons):	per cwt
100% rag	—
75% "	—
50% "	—
25% "	—
Rag Content Ledger (white, 5000 to 10,000 lb., ream sealed cartons):	
100% rag	—
75% "	—
50% "	—
25% "	—
Sulfite Bond (white, 5000 to 10,000-lb. sub 20, ream sealed cartons):	
No. 1	—
No. 2	—
No. 4	—
Sulfite Ledger (white, 5000 to 10,000-lb., ream sealed cartons):	
No. 1	—
No. 2	—
No. 4	—

Newsprint (contract base price)	per ton
Rolls, standard	135.00
Sheets	Standard differentials

Kraft Wrapping — Natural (standard rolls 9- and 15-in. diam.)	per cwt
70-lb. and heavier	8.75
60-lb.	9.00
50-lb.	9.25
40-lb.	9.50
35-lb.	10.00
30-lb.	10.75
25-lb.	11.50
20-lb.	12.50
No. 1 Kraft Butcher — Pink	per cwt
40-lb. only	10.25

(Sheets — Plus 50c cwt)

News of the Industry . . .

(Continued from page 883)

Bemis Bro. Bag Co.

F. G. Bemis of Boston was elected chairman of the board and Judson Bemis of Minneapolis has been elected as president and chief executive officer of the company.

The board also announced that C. W. Akin of Minneapolis has been elected as executive vice president, R. V. Scott of St. Louis and B. L. Willmore of Boston, as vice presidents. J. T. Braxtan of St. Louis has become assistant secretary.

K. Stewart McCord, assistant to the company's director of paper procurement, has been appointed to the newly created position of inventory administrator at the company's Boston offices. McCord will be succeeded by Richard F. Allen, laboratory supervisor. H. E. Earthal, engineer at the company's engineering research laboratory in St. Louis, will transfer to the Boston paper control laboratory as supervisor to replace Allen.

George E. Nelson has been appointed production manager of the firm's San Francisco bag plant. The San Francisco plant will move early this summer to new facilities in Newark, Calif. Nelson succeeds Frank W. Peters who has been named facilities engineer.

F. G. Bemis

J. Bemis

G. E. Nelson

C. W. Akin

Hardinge Co. Inc.

Jack D. Power has been named Central district manager with headquarters at 205 West Wacker Drive in Chicago, Ill. This district includes Indiana, Illinois, Iowa, Missouri, Arkansas, Nebraska, Kansas and Oklahoma, as well as portions of Michigan, Wisconsin, Kentucky and Texas.

Charles C. Nolan has been named Western district manager with headquarters in San Francisco, Calif. He will succeed retiring manager R. L. Baldwin.

Consolidated Paper Co.

William A. Lunsford has been promoted to manager of Research and development. To replace Lunsford as Technical manager, David W. Flotow has been appointed to that position.

In the new branch plant at Bremen, Ind., Robert J. Bedell has been appointed as factory manager. Bedell came to Consolidated a year ago as plant manager.

Nalco Chemical Co.

Robert R. Burns, formerly product manager for the industrial process chemicals in the industrial division, has been appointed manager of a newly created commercial development department.

The new department will search out and evaluate potential new markets and products and direct the marketing of new products until they are ready to be turned over to an operating division.

Associated with Burns in the new department will be Jerome Green.

Western Michigan University

The following have accepted appointments to the Paper Technology Advisory Committee at Western Michigan University.

Leonard R. Growdon, vice president of Mead Corp., Chillicothe, Ohio; E. J. Gilman, vice president and mill manager of Allied Paper Corp., Kalamazoo; Robert D. Caine, vice president, of KVP Sutherland Paper Co., Kalamazoo; and Edward E. Stephenson, director of quality for KVP Sutherland Paper Co.

Bert H. Cooper was re-elected as chairman and William A. Kirkpatrick is vice chairman.

H. K. Ferguson Co.

The company announces the appointment of Aubrey T. Taylor as assistant director of the pulp and paper division. In his new position, Taylor will assist the division director, William T. Webster, in assuring Ferguson clients in the industry of the accurate translation of their basic concepts and design criteria into the working drawings and specifications required to construct, equip and deliver the operating facilities desired.

Necrology . . .

Carol Case Dennison

Mrs. Dennison was chairman of the board of Case Brothers Inc. of Manchester, Conn. She was active in the management of Case for over 50 years and was president of the company prior to her assumption of the chairmanship in 1952.

Charles Palmer Drumm

Charles Drumm was chairman of the board of Albany Felt Co. He had a career of more than 40 years with the company.

Joseph E. Fleury

Professor Joseph E. Fleury was paper technology specialist for Armour Research Foundation of Illinois Institute of Technology. Fleury had been with the Paper Making Institute since its founding and was one of the four ARF specialists on the staff of the Union of Burma Applied Research Institute in Rangoon. In addition to teaching at the Institute, he instigated and supervised an experimental paper-making mill, and consulted on paper research projects for a number of companies including work in Haiti, Cuba, Trinidad, Costa Rica, Honduras, Brazil, Peru and Mexico.

TAPPI meeting

(Continued from page 864)

Hurm of Beloit Iron Works. The new dryer with excellent heat transfer characteristics is expected to improve sheet finish, supercalendering, etc.

A. H. Nissan, Rensselaer Polytechnic Institute, and D. Hansen, Union Carbide Nuclear Co., discussed heat transfer equations, evaporation of water on a cylinder dryer, and the mechanism of water removal.

The effective use of low temperature, liquid-heated radiators in paper drying was reported by H. L. Smith Jr., of Horace L. Smith, Jr. Inc. The effectiveness of these radiators is due to the almost perfect absorption of radiant heat in the long wave lengths of 4-8 microns. The radiators are curved and mounted on the paper machine with the radiating surface spaced from 2-6 in. from the sheet. As a measure of their performance, it was reported that 1½ lb. of water can be evaporated per square foot of radiator surface per hour.

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MAPLE END-OF-GRAIN SLOTTED

WIRE LO-VAC SAVER

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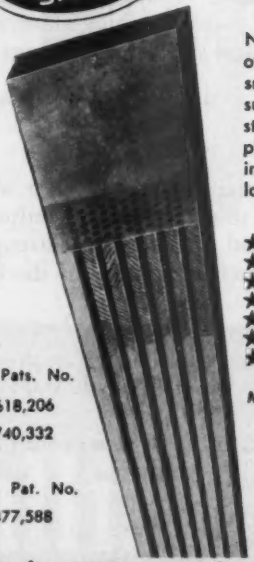

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★ GIVES LONGER WIRE LIFE
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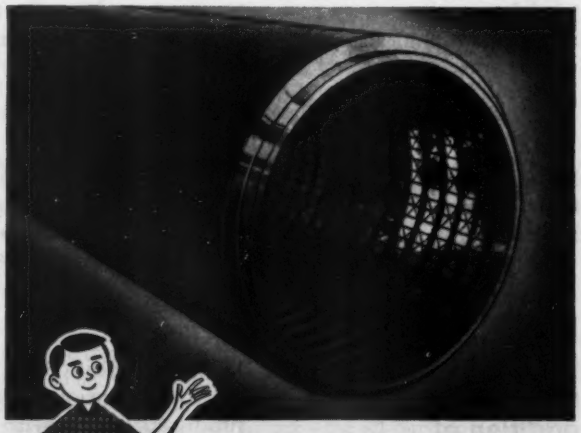

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Vacuum supplied by blowers or compressors

Blowers have been installed at the E. B. Eddy mill to provide vacuum for the new combination Yankee-fourdrinier machine. One of the outstanding characteristics of the blower is that it maintains a relatively constant vacuum for a rather wide range of air volume. Three vacuum headers (designed as high, medium and low) are connected respectively to the first, second and third branch inlets of both blowers. The different headers are also connected, depending on how much vacuum is required, to the suction couch roll, the presses, the suction boxes etc.

An added advantage of the blowers is that the heat of compression is used to assist in the drying of paper by introducing the hot air into and mixing it with the air supply to the Yankee dryer hood. The hot air from the blower represents about 25 per cent by volume and 45 per cent of the total heat requirements on towelling grades.

Paper mulches increase vegetable yields

An improved kraft paper, that contains fungicides to prevent it from breaking down before the end of the season, has been used successfully as a mulching material in vegetable gardens. These mulches control weeds, conserve water, keep fruits clean, warm the soil in spring, prevent leaching of nutrients, are economical to use, and can be plowed under at the end of the season.

Paper machine lubrication studies

In order to simulate operations of a paper machine, Texaco Inc. has set up a 10-ft. long laboratory test machine to study paper machine lubrication problems. The test machine can place pressures and speeds on bearings that exceed those on a full-size paper machine.

Wet strength through wet end addition of dialdehyde starch

Wet end addition of dialdehyde starch (in conjunction with alum which aids the retention of dialdehyde starch in pulp) to representative pulps has produced papers with excellent wet strengths and improved dry strengths, according to results obtained at the Peoria research laboratory of the U. S. Department of Agriculture.

Among the advantages of the use of dialdehyde starches are: (1) easy broke recovery; (2) rapid development of wet strength; (3) no heat or curing is necessary to develop wet strength; and (4) dialdehyde starch dispersions require no aging.

The quantities of dialdehyde starch required are 0.5-2.5 per cent of the dry pulp weight.

Scented polyethylene film

Scented polyethylene film is a new development reported by U. S. Industrial Chemicals Co. Some of the aromas presently incorporated into polyethylene film are tweed, cedar, pine and spruce.

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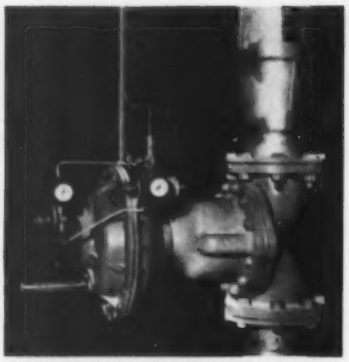
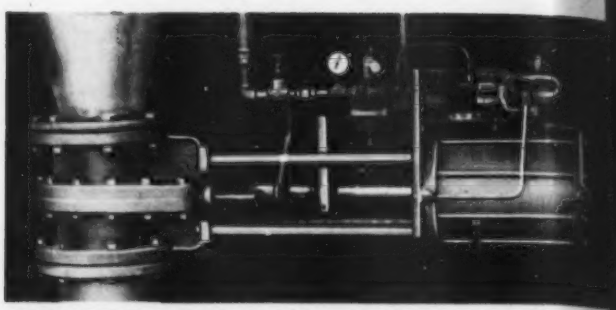


SAUNDERS VALVE (Conoflow close-coupled type) affords automatic throttling control of white water in bleach plant at Marathon Southern's Naheola, Alabama mill. Conoflow is the world's largest producer of Saunders valves for automatic control.

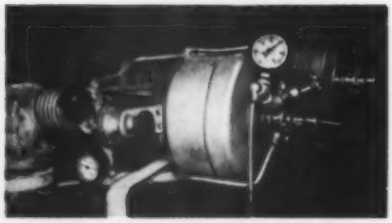


PULP STOCK VALVE (8" Walworth with Conoflow actuator) on automatic control service at Crossett Paper Mills, Crossett, Arkansas. Conoflow actuated pulp stock valves are available in all sizes.

CONOFLOW

CONTROLLED FLOW

AUTOMATION IN PAPER MAKING

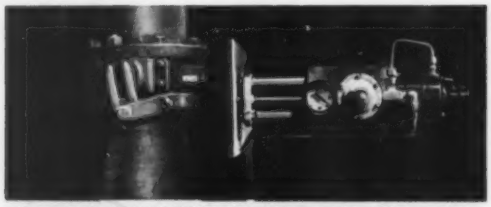


CONTROL VALVES (Conoflow Series LB) on a tough service at the R-W Paper Company plant in Longview, Washington. These 2" single-seated angle valves are handling steam at 700°F. and 600 psi with a 580 lb. pressure drop.

The installations shown here are typical of how Conoflow final control elements have helped bring automation to the pulp and paper industry. Conoflow products make possible faster, more efficient operations, and substantial savings of costly process fluids for many modern paper mills.

VALUABLE DATA FREE! To find out where automatic process control can help you, write for Bulletin MD-1 *Application of Conoflow Equipment in Modern Pulp and Paper Making Processes.* Also ask for reprint *How to Use Standard Pulp Valves for Throttling Control*—a thought-provoking and informative article. Both will be mailed to you promptly, without obligation. Dept. C-901, Conoflow Corporation, 2100 Arch Street, Philadelphia 3, Pa. Conoflow engineering representatives are located in principal cities throughout the world.

PRESSURE TRANSMITTERS (Conoflow Model P) measuring pressure of pulp stock during bleaching process at the P. H. Glatfelter paper plant in Spring Grove, Pa. This is one of several Conoflow Model P's measuring pressure and liquid level at this mill.



BUTTERFLY VALVE (Conoflow actuated) on automatic control service at Crossett Paper Mills, Crossett, Arkansas.

CURRENT CONTROLLERS (Conoflow Model EB) regulating speed of washer thickeners in bleach plant at Marathon Southern mill in Naheola, Alabama. The Model EB is a unique pneumatic-electric transducer—a Conoflow exclusive for the paper industry.

CONOFLOW CORPORATION

FOREMOST IN FINAL CONTROL ELEMENTS

SUBSIDIARY WALWORTH

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